ORDER NO. SD8103-1856C8

Service Manual

QUARTZ Direct Drive Automatic Turntable System

SL-QL1

[E], [EK], [XL], [EF],
[XA], [EB], [EG], [EI], [EH]

SL-QL1(K)

[XL], [EG],
[E], [EH], [XA]

***The colors of this model include silver and black. The black type model is provided with (K) in the Service Manual.**

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EF] is available in France.
- * [EB] is available in Belgium.
- * [EG] is available in F.R. Germany.
- * [EI] is available in Italy.
- * [EH] is available in Holland.
- * [XA] is available in East South Asia, Oceania, Africa, Middle Near East and Central South America.

English

Specifications

Specifications are subject to change without notice for further improvement.
Weight and dimensions shown are approximate.

■ General

Power supply:	~110-120/220-240V, 50/60 Hz
Power consumption:	20 W
Dimensions: (W x H x D)	43 x 8.8 x 35 cm 43 x 39.7 x 35 cm (Maximum height when top (dust cover) is open.)
Weight:	7.4 kg (16.3 lb.)

■ Turntable section

Type:	Quartz direct drive Automatic turntable Auto start/Auto lead-in Auto return Auto stop Repeat play Auto speed select Manual speed selection possible. Auto size select 2-speed search functions Record presence detection
Drive method:	Direct drive
Motor:	Brushless DC motor
Drive control method:	Quartz-phase-locked control
Turntable platter:	Aluminum die-cast Diameter 31.2 cm
Turntable speeds:	33-1/3 rpm and 45 rpm Auto speed select (Manual selection possible)
Speed deviation:	Within ±0.002%
Wow and flutter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ±0.035% peak (IEC 98A Weighted)

*Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble:	–56 dB (IEC 98A Unweighted) –78 dB (IEC 98A Weighted)

■ Tonearm section

Type:	Dynamic balanced type Linear tracking tonearm 4-pivot gimbal suspension
Effective length:	10.5 cm (4-1/8")
Tracking error angle:	Within ±0.1°
Effective mass:	9 g (including cartridge)
Resonance frequency:	12 Hz
Tonearm drive motor:	DC motor

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ Cartridge section

Type:	Moving magnet stereo cartridge One point suspension system
Magnet:	Samarium cobalt (Sm-Co)
Cantilever:	Pure boron pipe
Magnetic circuit:	All laminated core
Frequency response:	10 Hz to 50 kHz 20 Hz to 35 kHz ±3 dB 20 Hz to 10 kHz ±1 dB
Output voltage:	2.5 mV at 1 kHz, 5 cm/s. zero to peak lateral velocity (7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500])
Channel separation:	More than 22 dB at 1 kHz
Channel balance:	Within 1.8 dB at 1 kHz
Recommended load impedance:	47 kΩ ∼ 100kΩ
Compliance (dynamic):	12×10^{-6} cm/dyne at 100 Hz
Vertical tracking angle:	20°
Stylus pressure range:	1.25 ± 0.25 g (12.5 ± 2.5 mN)
Stylus tip:	0.3 x 0.7 mil (7.5 x 18μm)
Weight:	6 g (cartridge only)
Replacement stylus:	EPS-22ES (Equivalent replacement stylus: EPS-22EB (EPS-202ED).)

Deutsch

TECHNISCHE DATEN

Änderungen der technischen Daten vorbehalten.
Die angegebenen Gewichts- und Abmessungsdaten sind circa Werte.

■ Allgemeine Daten

Stromversorgung:	∼110-120/220-240 V, 50/60 Hz Wechselstrom
Leistungsaufnahme:	20 W
Abmessungen: (B x H x T)	43 x 8,8 x 35 cm 43 x 39,7 x 35 cm (Maximale Höhe bei vollständig geöffentem Gehäuseoberteil.)
Gewicht:	7,4 kg

■ Plattenspieler

Typ:	Quarz-Direktantrieb Automatischer Plattenspieler Auto-Start/Auto-Zuführung Rückführautomatik Stopp-Automatik Wiederhol-Betrieb Automatische Drehzahlwahl Manuelle Drehzahlwahl möglich 2-Geschwindigkeiten-Suchfunktionen Plattenpräsenz-Registrierung
Antrieb:	Direktantrieb
Motor:	Kollektorloser Gleichstrommotor
Antriebsregel-Methode:	Quarz-Steuerung (QPL)
Plattenteller:	Aluminium-Druckguß Durchmesser 31,2 cm
Plattenteller-Drehzahlen:	33-1/3 und 45 U/min Automatische Drehzahlwahl (manuelle Wahl möglich)
Drehzahlabweichung:	Innerhalb ±0,002%
Gleichlaufschwankungen:	0,012% WRMS* 0,025% WRMS (JIS C5521) ±0,035% Spitze (IEC 98A bewertet)

*Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorbauteils.

Rumpel-Fremdspannungsabstand:	–56 dB (IEC 98A unbewertet)
Rumpel-Geräuschspannungsabstand:	–78 dB (IEC 98A bewertet)

■ Tonarm

Typ:	Dynamisch ausbalancierter Tangential-Tonarm mit Kardanaufhängung mit 4-Punkt-Drehlager
Effektive Länge:	105 mm
Spurfehlwinkel:	Innerhalb ±0,1°
Effektive Masse:	9 g (einschließlich Tonabnehmer)
Resonanzfrequenz:	12 Hz
Tonarm-Antriebsmotor:	Gleichstrommotor

■ Tonabnehmer

Typ:	Stereo-Magnet-Tonabnehmer mit Einpunkt-Aufhöngungssystem
Magnet:	Samarium-Kobalt (SM-Co)
Nadelträger:	Röhre aus reinem Bor
Magnetkreis:	Ganzlamellenkern
Frequenzgang:	10 Hz bis 50 kHz 20 Hz bis 35 kHz ±3 dB 20 Hz bis 10 kHz ± 1 dB
Ausgangsspannung:	2,5 mV bie 1 kHz 5 cm/s. Null-zu-Spitze, lateral [7 mV bei 1 kHz 10 cm/s. Null-zu Spitze, 45° (DIN 45 500)]
Kanaltrennung:	Mehr als 22 dB bei 1 kHz
Empfohlene Endimpedanz:	47 kΩ ∼ 100kΩ
Nachgiebigkeit (dynamisch):	12×10^{-6} cm/dyn bei 100 Hz
Vertikaler Spurwinkel:	20°
Auflagekraft-Einstellbereich:	1,25 ±0,25 g (12,5 ± 2,5 mN)
Nadelspitze:	0,3 x 0,7 Mil (7,5 x 18μm)
Gewicht:	6 g (nur Tonabnehmer)
Ersatznadel:	EPS-22ES (Gleichwertige Ersatznadel: EPS-22ED (EPS-202ED))

Français

CARACTERSTIQUES

Les spécifications sont susceptibles d'être modifiées sans préavis.
Le poids et les dimensions donnés sont approximatifs.

Généralités

Alimentation:	Alternatif 110-120/220-240V, 50/60 Hz
Consommation:	20 W
Dimensions: (L x H x P)	43 x 8,8 x 35 cm 43 x 39,7 x 35 cm (Hauteur maximum lorsque le dessus (couvercle protègepoussière) est ouvert.)
Poids:	7,4 kg

Platine de lecture

Type:	Entraînement direct à quartz Platine automatique Départ automatique/Entrée automatique Retour automatique Arrêt automatique Audition répétée Sélection de vitesse automatique Sélection de vitesses manuelle possible Sélection automatique du diamètre Fonctions exploratrices à 2 vitesses Détection de la présence d'un disque
Système d'entraînement:	Entraînement direct
Moteur:	Moteur C.C. sans balai
Groupe de réglage:	Réglage d'accrochage de phase par quartz
Plateau de lecture:	Aluminium moulé sous pression Diamètre 31,2 cm
Vitesses de rotation:	33-1/3 et 45 t/p.m Sélecteur de vitesse automatique (Sélection manuelle possible)
Déviation de la vitesse:	En deçá de ±0,002%
Pleurage et scintillement:	0,012% de valeur efficace* 0,025% de valeur efficace (JIS C5521) ±0,035% de crête (IEC 98A Pondéré)

*Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

Ronflement:	–56 dB (IEC 98A Non pondéré) –78 dB (IEC 98A pondéré)

Bras de lecture

Type:	Bras de lecture d'alignement linéaire de type à équilibre dynamique avec suspension à la cardan à 4 pivots
Longueur effective:	105 mm
Angle d'erreur de piste:	En deçà de ±0,1°
Masse réelle:	9 g (y compris la cellule pick-up)
Fréquence de résonance:	12 Hz
Moteur d'entraînement du bras de lecture:	Moteur C.C. sans noyau

Cellule pick-up

Type:	Cellule pick-up stéréo à aimant mobile Système de suspension ponctuelle
Aimant:	Samarium-Cobalt (Sm-Co)
Porte-à-faux:	Tube à bore pur
Circuit magnétique:	Noyau entièrement feuilleté
Réponse en fréquence:	10 Hz à 50 kHz 20 Hz à 35 kHz ± 3 dB 20 Hz à 10 kHz ± 1 dB
Tension de sortie:	2,5 mV à 1 kHz; 5 cm/s., zéro à vitesse latérale de crête (7 mV à 1 kHz; 10 cm/s., zéro à vitesse 45° de crête [DIN 45 500])
Séparation des canaux:	Plus de 22 dB à 1 kHz
Equilibrage des canaux:	Endeçà de 1,8 dB à 1 kHz
Impédance de charge recommandée:	47 kΩ ~ 100 kΩ
Elasticité (dynamique):	12 x 10^{-6} cm/dyne à 100 Hz
Angle d'alignement vertical:	20°
Plage de la force verticale:	1,25 ± 0,25 g (12,5 ± 2,5 mN)
Extrémité de la pointe de lecture:	0,3 x 0,7 mil (7,5 x 18μm)
Poids:	6 g (cellule seule)
Remplacement de la pointe de lecture:	EPS-22ES (Pointe de lecture de remplacement équivalente: EPS-22ED (EPS-202ED))

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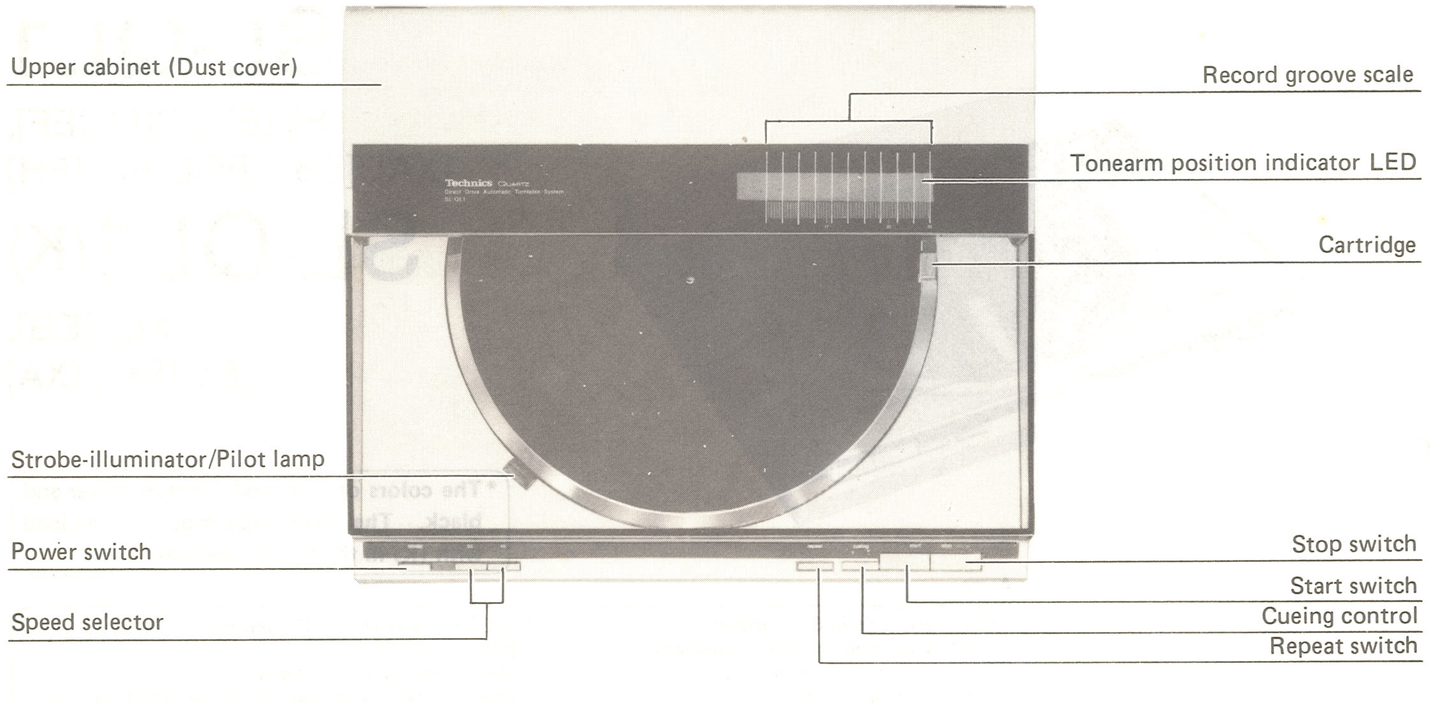
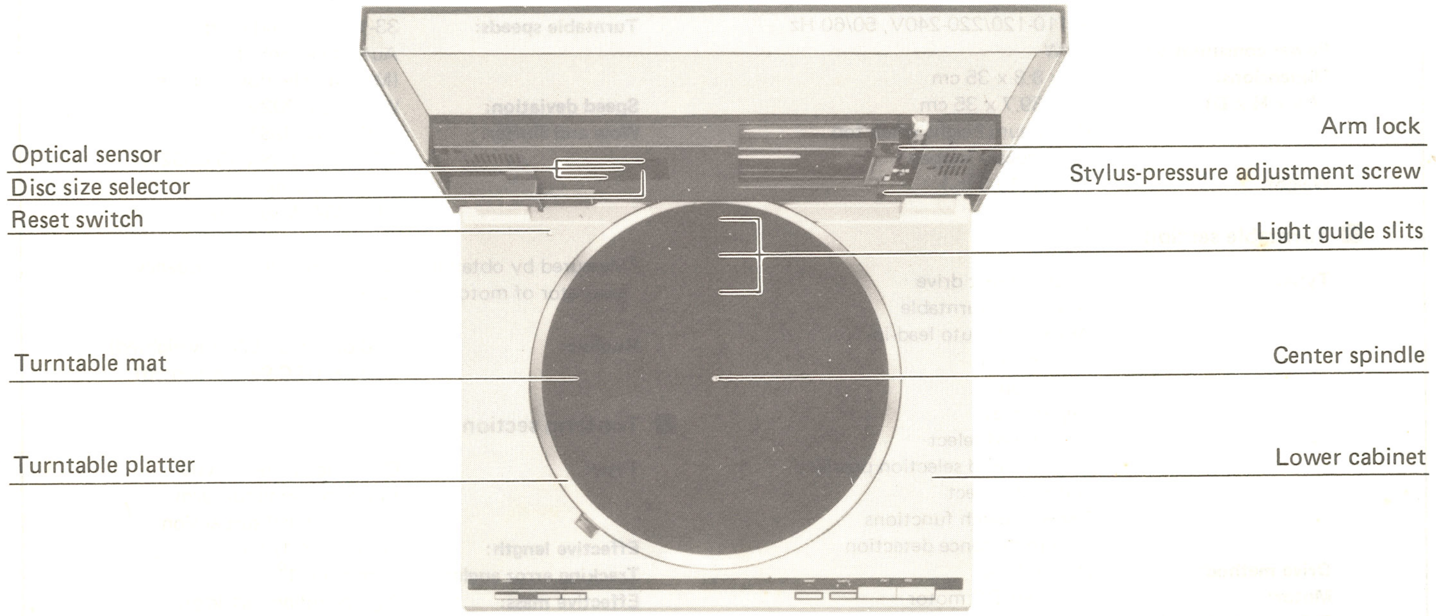
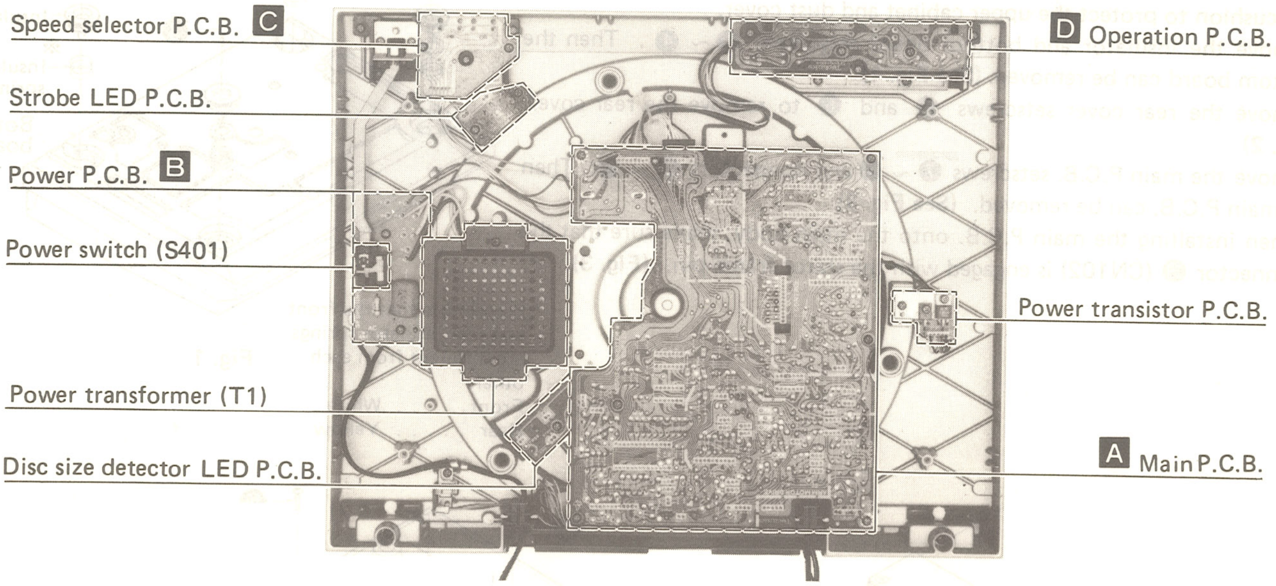
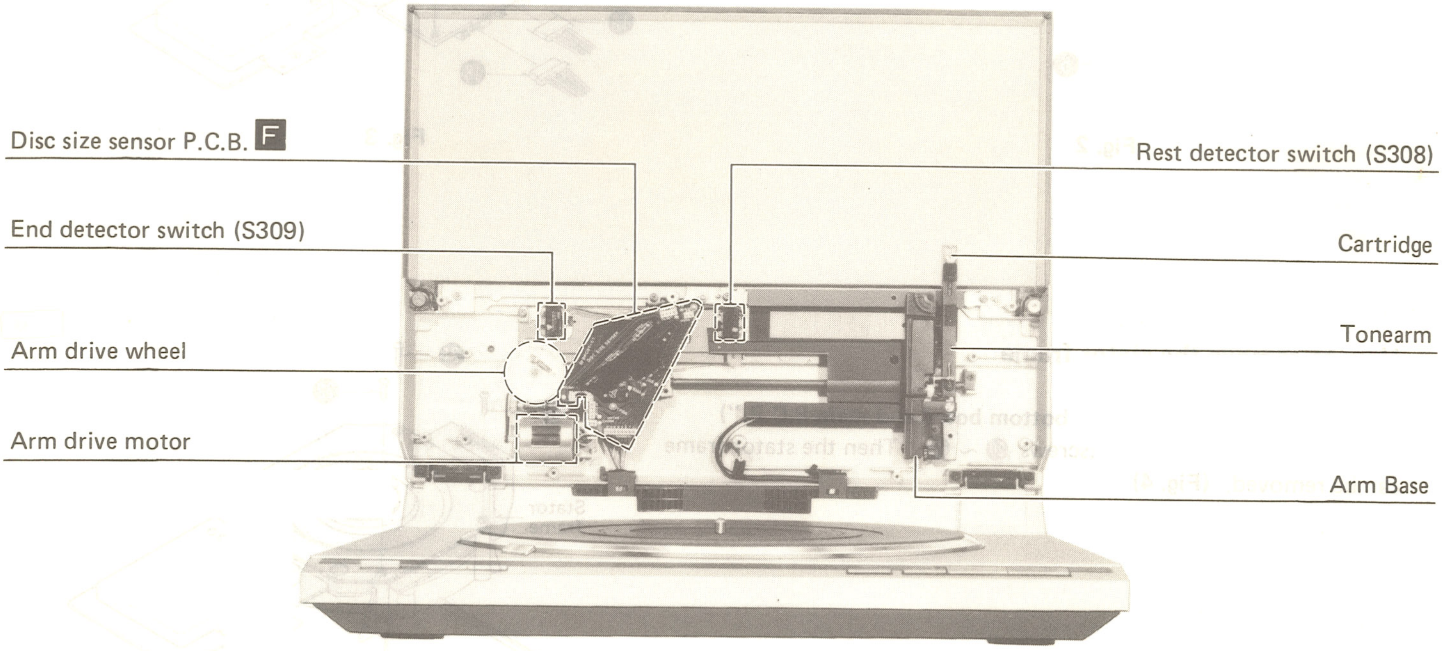
LOCATION OF CONTROLS


Upper cabinet (Dust cover)
Record groove scale
Tonearm position indicator LED
Cartridge
Strobe-illuminator/Pilot lamp
Power switch
Speed selector
Stop switch
Start switch
Cueing control
Repeat switch


Optical sensor
Disc size selector
Reset switch
Turntable mat
Turntable platter
Arm lock
Stylus-pressure adjustment screw
Light guide slits
Center spindle
Lower cabinet


Speed selector P.C.B. C
Strobe LED P.C.B.
Power P.C.B. B
Power switch (S401)
Power transformer (T1)
Disc size detector LED P.C.B.
D Operation P.C.B.
Power transistor P.C.B.
A Main P.C.B.

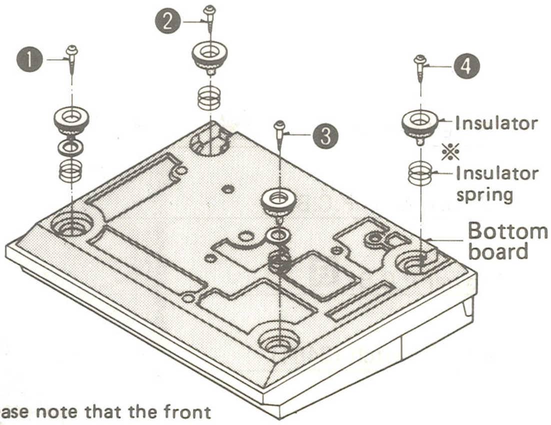

Disc size sensor P.C.B. F
End detector switch (S309)
Arm drive wheel
Arm drive motor
Rest detector switch (S308)
Cartridge
Tonearm
Arm Base

*** S309 (end detection switch) will be replaced by MN1400PE of which the end detection unit is built into MN1400PA (IC301) in the course of manufacture.**
At the time of servicing, it is possible to replace MN1400PA with MN1400PE, but not MN1400PE with MN1400PA. Incidentally, MN1400PE will be supplied as repair parts.

■ DISASSEMBLY INSTRUCTIONS

• How to remove the bottom board and main P.C.B.

1. Remove the turntable and turntable seat.
2. Turn the main body upside down, using a solft sheet of cloth or the like as a cushion to protect the upper cabinet and dust cover.
3. Remove the insulator and bottom board setscrews ① ~ ④. Then the bottom board can be removed. **(See Fig. 1)**
4. Remove the rear cover setscrews ⑤ and ⑥ to remove the rear cover. **(Fig. 2)**
5. Remove the main P.C.B. setscrews ⑦ ~ ⑬ and connectors ⑭ ~ ⑱. Then the main P.C.B. can be removed. **(See Fig. 3)**
   *When installing the main P.C.B. onto the main body, make sure that the connector ⑲ (CN102) is engaged with the stator frame pin. **(Fig. 3)**



* Please note that the front and rear insulator springs are different from each other.
Front . . . . . .White
Rear . . . . . .Yellow

Fig. 1

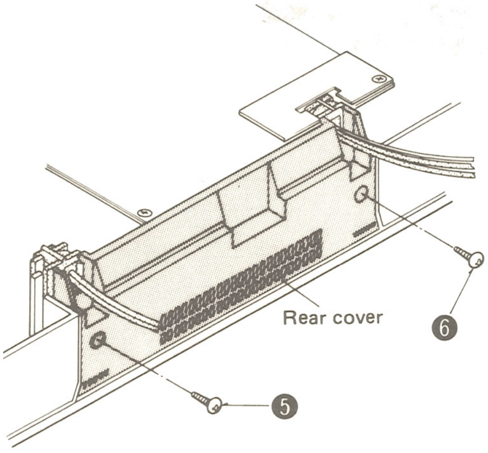


Fig. 2

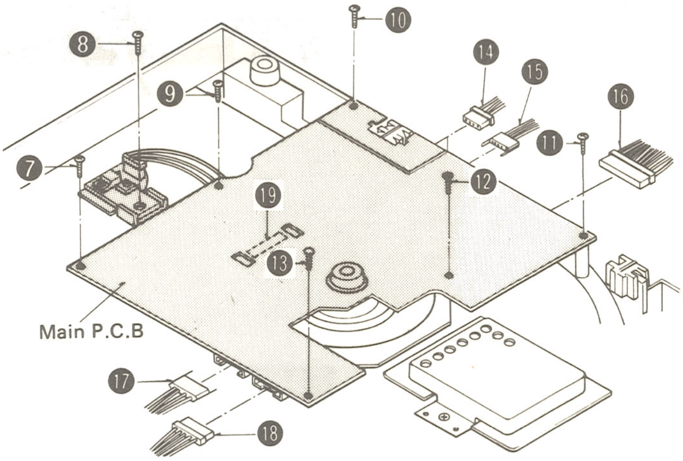


Fig. 3

• How to remove the stator frame

1. Remove the main P.C.B.
   (Refer to "How to remove the bottom board and main P.C.B.")
2. Remove the stator frame setscrews ⑳ ~ ㉓. Then the stator frame can be removed. **(Fig. 4)**

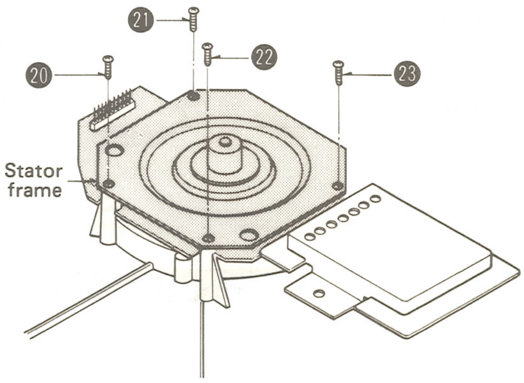


Fig. 4

● How to remove the cartridge

1. Open the upper cabinet and turn the arm lock in the direction of the arrow to lock the tonearm.
2. Loosen the cartridge setscrew with the attached screwdriver. (Turn the setscrew until it is freed as shown in **Fig. 5.**)
3. Pull out the cartridge, taking care not to touch the stylus. **(Fig. 6)**
4. When mounting the cartridge, match the tonearm connector with the cartridge pin and completely insert the cartridge and tighten the setscrew. **(Fig. 6)**

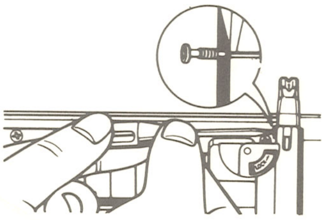


Fig. 5

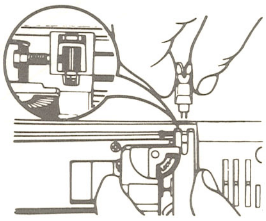


Fig. 6

● How to remove the surface plate and dust cover

1. Remove the cartridge. **(Refer to "How to remove the cartridge".)**
2. Open the upper cabinet and push the scale part of the surface plate from inside. **(Fig. 7)**
   *Carefully remove the surface plate since it is secured with double-sided tape.
3. Remove the dust cover setscrews ㉔ ~ ㉖ . **(Fig. 8)**
4. Completely open the dust cover; remove the upper cabinet cover setscrews ㉗ ~ ㉟ ; and remove the upper cabinet cover while pulling the tonearm in the direction of the arrow. **(Fig. 9)**
5. Remove the dust cover setscrews ㊱ and ㊲ .
   Then the dust cover can be removed by pulling it in the direction of the arrow. **(Fig. 10)**

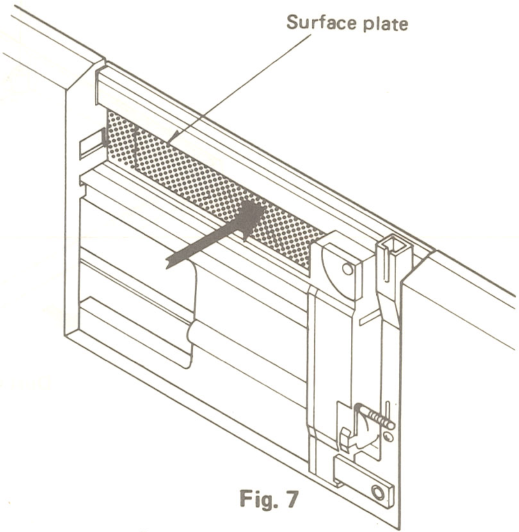


Fig. 7

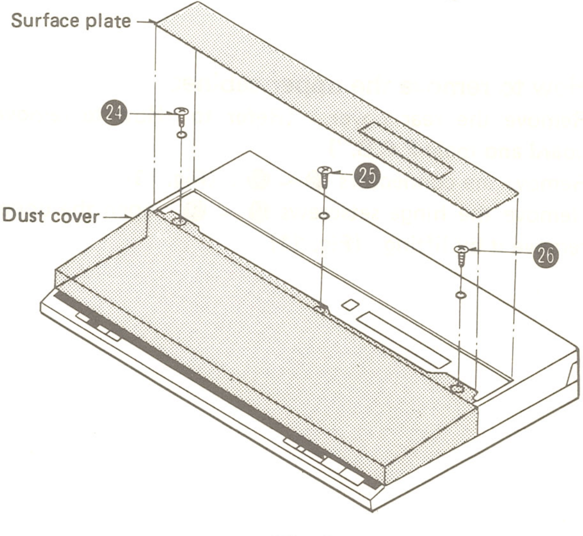
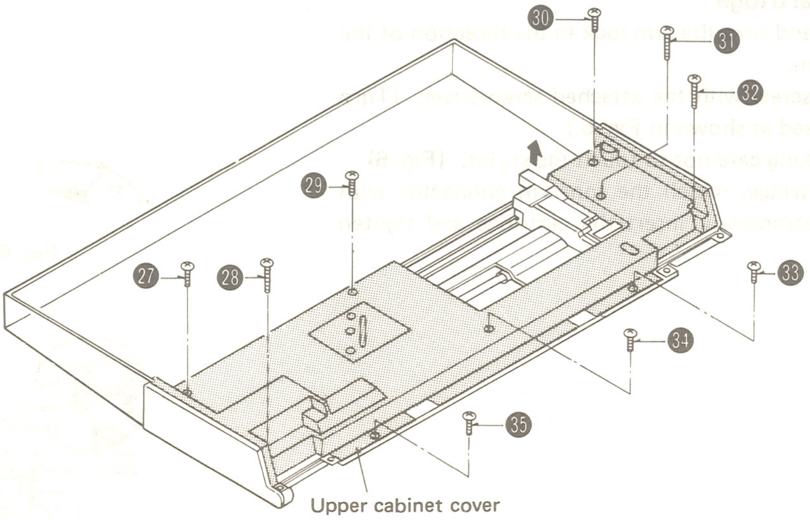
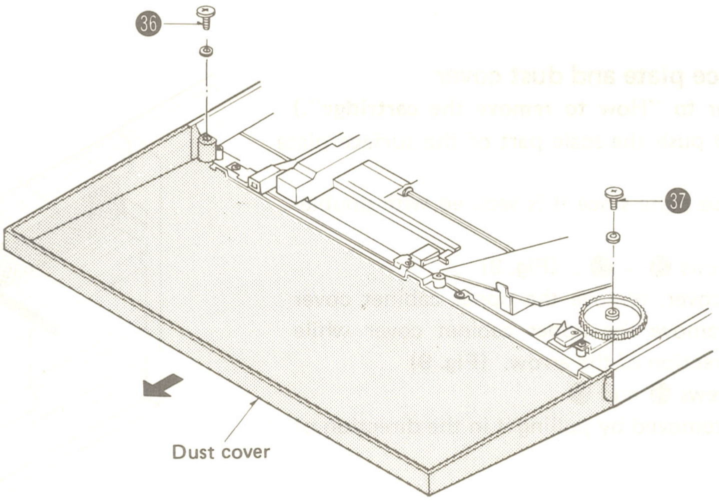


Fig. 8



㉚
㉛
㉜
㉙
㉗
㉘
㉝
㉞
㉟
Upper cabinet cover

Fig. 9

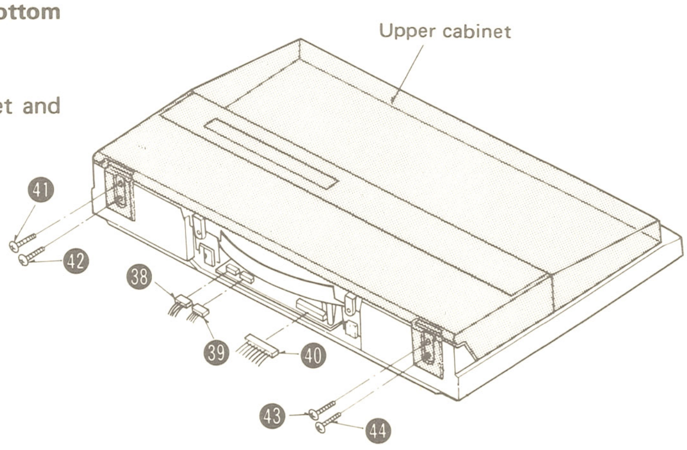


㊱
㊲
Dust cover

Fig. 10

• How to remove the upper cabinet

1. Remove the rear cover. **(Refer to "How to remove the bottom board and main P.C.B.")**
2. Remove the connectors ㊳ ~ ㊵ . **(Fig. 11)**
3. Remove the hinge setscrews ㊶ ~ ㊹ ; open the upper cabinet and remove it by lifting. **(Fig. 11)**

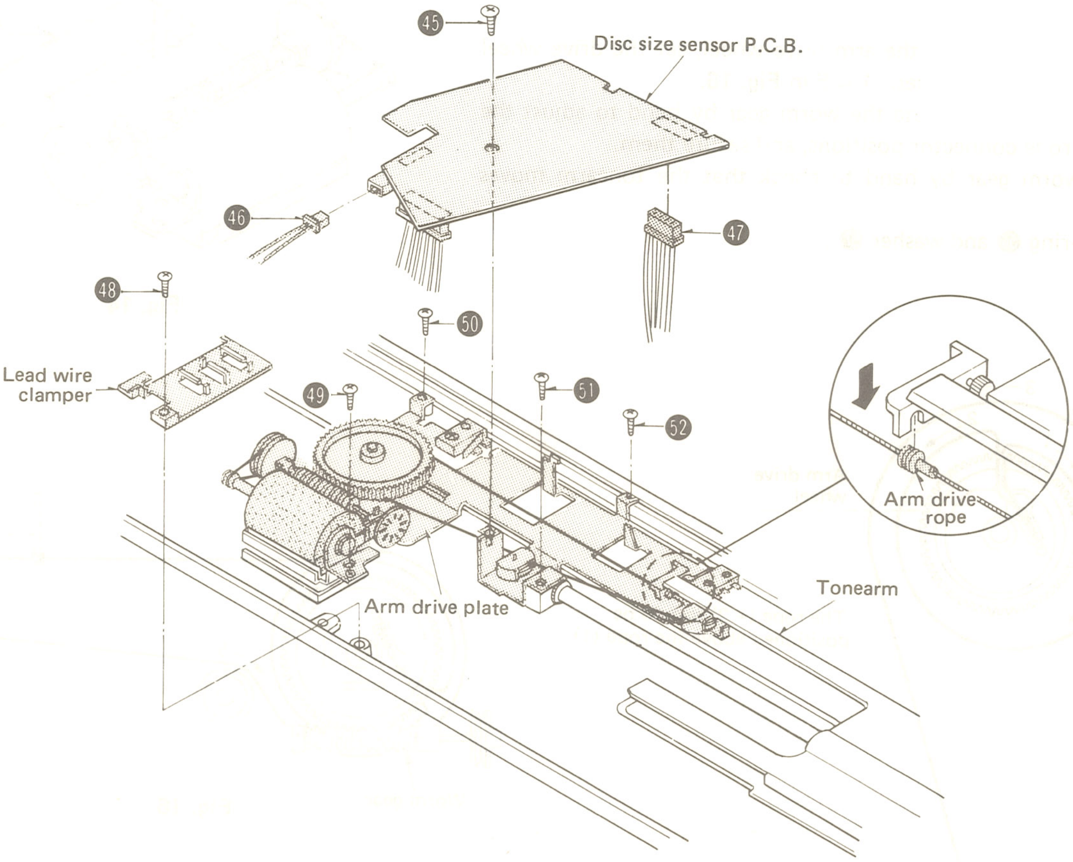


Upper cabinet
㊶
㊷
㊳
㊴
㊵
㊸
㊹

Fig. 11

● How to remove the arm drive plate and disc size sensor P.C.B.

1. Remove the upper cabinet cover. **(Refer to "How to remove the surface plate and dust cover.")**
2. Remove the disc size sensor P.C.B. setscrew ㊺ and connectors ㊻ , ㊼ . **(Fig. 12)**
3. To remove the disc size sensor P.C.B. completely, remove the upper cabinet and the lead wire clamper setscrew ㊽ in **Fig. 12. (Refer to "How to remove the upper cabinet.")**
4. Remove the arm drive rope from the tonearm, and remove the arm drive plate setscrews ㊾ ~ (52) . Then the arm drive board can be detached. **(Fig. 12)**

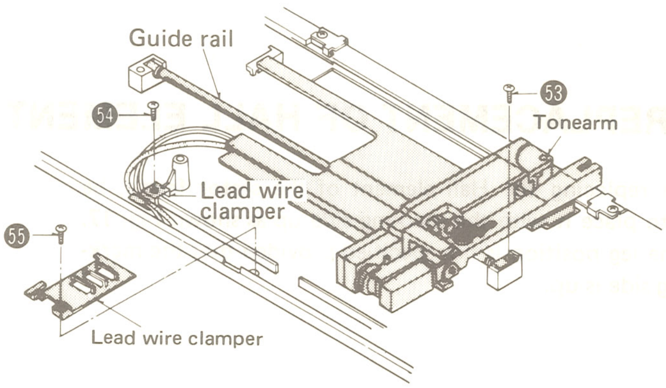


㊺
Disc size sensor P.C.B.
㊻
㊼
㊽
㊿
Lead wire clamper
㊾
(51)
(52)
Arm drive rope
Tonearm
Arm drive plate

Fig. 12

● How to remove the tonearm

1. Remove the upper cabinet. **(Refer to "How to remove the upper cabinet.")**
2. Remove the arm drive plate. **(Refer to "How to remove the arm drive plate and disc size sensor P.C.B.")**
3. Remove the tonearm guide rail setscrew (53) and lead wire clamper setscrews (54) , (55). Then the tonearm can be removed. **(Fig. 13)**



Guide rail
(53)
(54)
Tonearm
Lead wire clamper
(55)
Lead wire clamper

Fig. 13

■ HOW TO SET THE TONEARM DRIVE ROPE

If the rope is disengaged or when setting a new rope, follow the procedure below.

1. Remove the upper cabinet cover.
   (Refer to "Disassembly instructions.")
2. Remove the E-ring (56) and washer (57) to remove the arm drive wheel. **(Fig. 14)**
3. Turn over the arm drive wheel, and set the rope according to the steps 1 ~ 3 in **Fig. 15**.
4. Holding the rope set over the arm drive wheel, set the drive wheel and rope according to the steps 4 ~ 5 in **Fig. 16**.
5. After setting the rope, rotate the worm gear by hand to adjust the tonearm and rope connector positions, and secure them.
6. Rotate the worm gear by hand to check that the tonearm moves smoothly.
7. Mount the E-ring (56) and washer (57) .

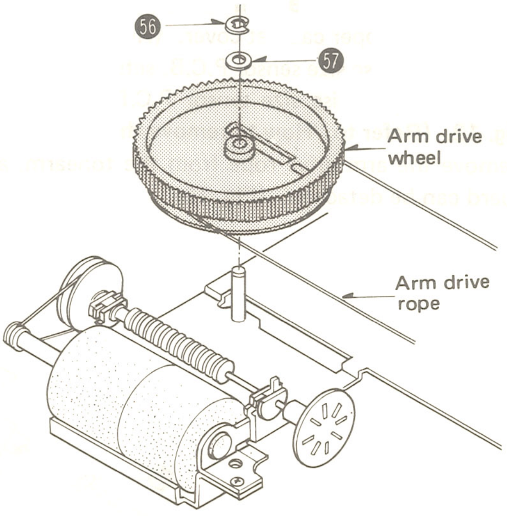
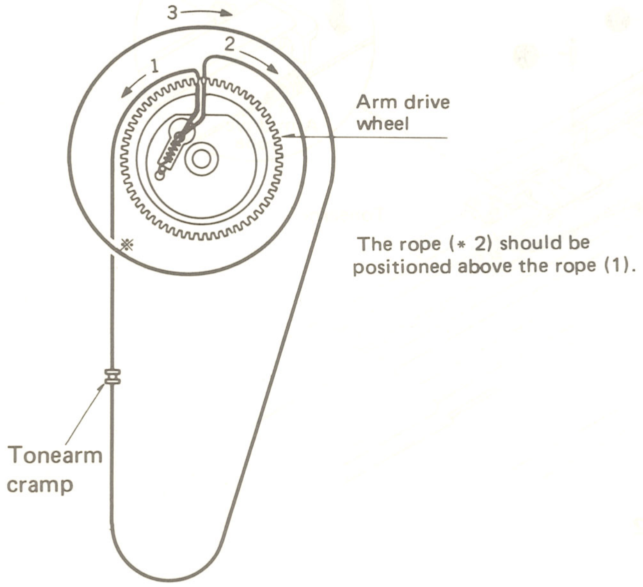

(56)
(57)
Arm drive wheel
Arm drive rope

Fig. 14


3
2
1
Arm drive wheel
※
Tonearm cramp

The rope (* 2) should be positioned above the rope (1).

Fig. 15

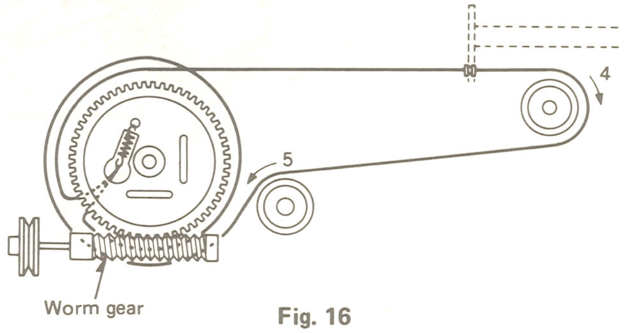

4
5
Worm gear

Fig. 16

■ REPLACEMENT OF HALL ELEMENT

When replacing the Hall element of the stator frame, be sure to place it with the marking side up as shown **Fig. 17**.

* The leg position is not specified provided that the marking side is up.

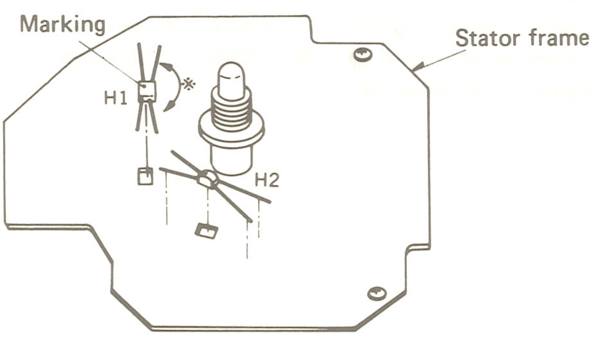

Marking
Stator frame
H1
※
H2

Fig. 17

■ DESCRIPTION OF CONNECTOR

Two types of connectors are used for this unit: one is directly soldered to the printed circuit board, and the other is insertion type.
The insertion type is represented by "CN", while the direct soldering type is by "BT". **(See Fig. 18)**
Note: Soldered connectors (indicated by BT) cannot be pulled out.

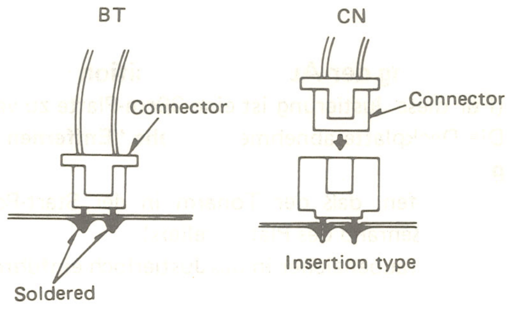


Fig. 18

■ MEASUREMENTS AND ADJUSTMENTS — English

• Adjustment of auto start

(Use a 30cm disc for this adjustment.)

1. Remove the surface plate. **(Refer to "Disassembly instructions.")**
2. Make sure that the tonearm is at the start position (the outermost periphery of turntable).
3. Insert the screwdriver into the adjusting hole. **(Fig. 19)**
   - *The start position is too much inside:
     Turn the screwdriver counterclockwise.
   - *The start position is too much outside:
     Turn the screwdriver clockwise.
4. If the start position is still deflected, turn the auto start position adjusting screw. **(Fig. 19)**
   - *The start position is too much inside:
     Turn it clockwise.
   - *The start position is too much outside:
     Turn it counterclockwise.
5. After the adjustment, be sure to lock the adjusting screw with bond.

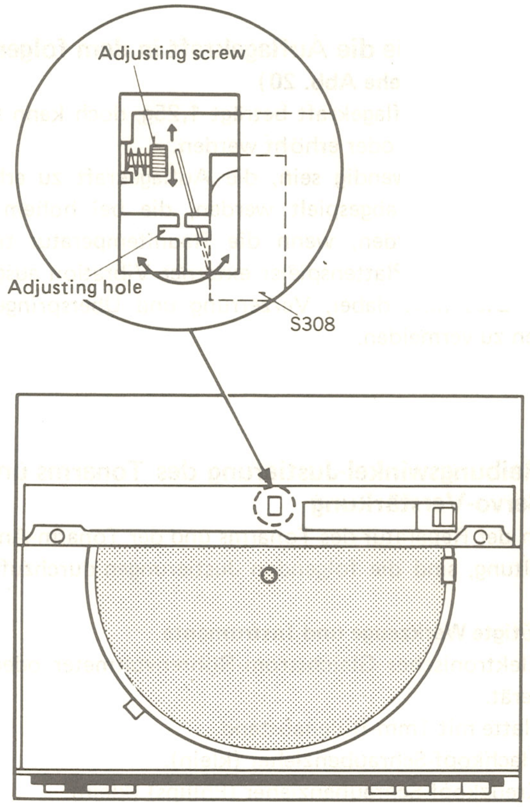


Fig. 19

• Adjustment for the stylus pressure

Stylus pressure is normally set to 1.25 grams but may be raised or lowered by ±0.25 grams. It may be necessary to increase stylus pressure when playing records cut at high levels, or when room temperature is low, or when the unit easily picks up eternal vibrations. This will help prevent distortion and groove-skipping. To adjust stylus pressure, turn either way, as shown in the diagram. The screw is coupled to the graduated ring.

Note: Do not turn the stylus pressure adjustment screw further than the set limits (1.5 g ~ 1.0 g)

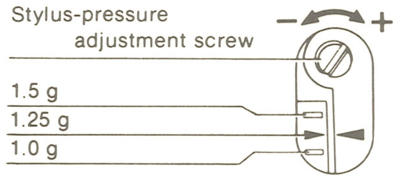


Fig. 20

• Offset adjustment of tonearm and servo gain

After repair of the tonearm and arm drive circuit, make the adjustment according to the following procedure.

Tools and equipment used

1. DC electronic voltmeters (VTVM).
2. 1mm pitch record.
3. Flat head screwdriver (small).
4. Phiplips head screwdriver (small).
5. Hexagon wrench (M1.5).

Condition of the set

1. Remove the dust cover and surface plate. **(Refer to "Disassembly instructions.")**
2. Turn the reset switch (S307) "on" by pressing it with tape. **(Fig. 21)**
3. Remove the rear cover. **(Refer to "Disassembly instructions.")**
4. Completely open the upper cabinet and make sure that the tonearm operates when the start button is pressed.

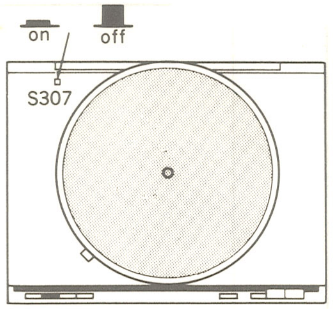
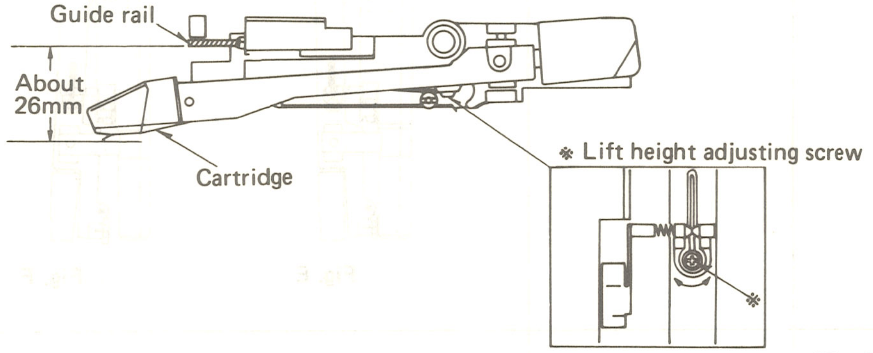
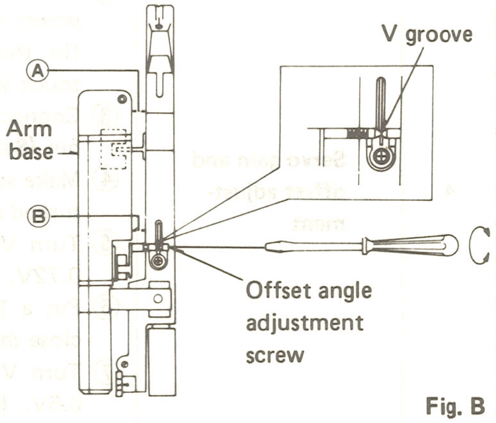
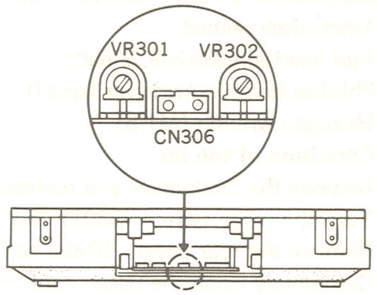
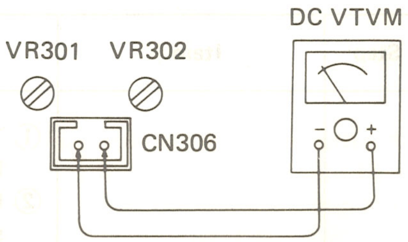
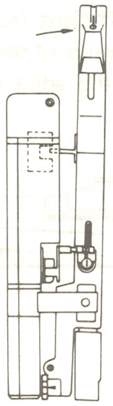
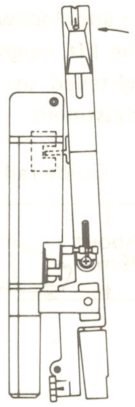
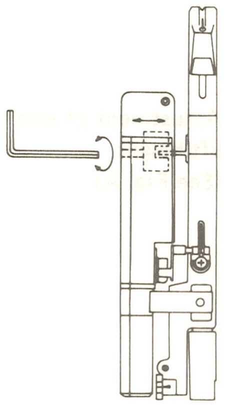
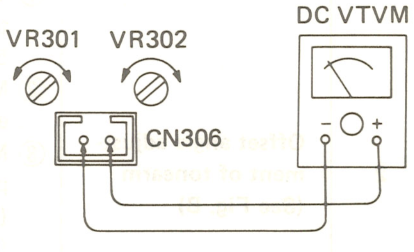


Fig. 21

Note: The tonearm does not operate with the turntable removed.

Step	Item	Adjustment method
1	**Adjustment of arm lift height (See Fig. A)**	① Turn the power switch "on" and move the tonearm towards the center of disc by pressing the start button. ② Press the cueing button to check that the clearance between the cartridge stylus and the guide rail is about 26mm. ③ If the clearance is incorrect, adjust the lift height by turning the adjusting screw with a flat head screwdriver. – Turn clockwise when excessive (> 26mm). – Turn anticlockwise when insufficient (< 26mm). **Note:** The lift height adjusting screws of the replacement tonearm is completely tightened up. So, loosen the adjusting screw before making the above adjustment.  Guide rail About 26mm Cartridge * Lift height adjusting screw Fig. A
2	**Offset angle adjustment of tonearm (See Fig. B)**	① Turn the power switch "on" and move the tonearm towards the center of disc by pressing the start button. ② Make sure that the arm center is aligned with the V groove of the lift lever. ③ Make sure that the arm base is in parallel with the arm. (Check the clearance between Ⓐ and Ⓑ in Fig. B.) ④ If the arm base is not in parallel with the arm, adjust it by turning the offset angle adjusting screw.  Ⓐ Arm base Ⓑ V groove Offset angle adjustment screw Fig. B

Step	Item	Adjustment method
3	Adjustment of tonearm sensitivity	① Turn the power switch "on" and move the tonearm towards the center of disc by pressing the start button. ② Press the cueing button and make sure that the arm is lowered. ③ Connect the DC VTVM to the connector pin. **(See Fig. C, D)** ④ Read the voltage values with the tonearm fully shifted to the right and left respectively. **(See Fig. E, F)** ⑤ Calculate the center voltage from the difference between the two voltage values. For example, when the voltage is 1.5V in **Fig. E** and 0.02V in **Fig. F** then $\frac{(1.5V - 0.02V)}{2} + 0.02V = 0.76V$ (middle point voltage) ⑥ Set the tonearm to the center position, and turn the adjusting screw of the arm base by a haxagon wrench until the center voltage is achieved. **(See Fig. G)**  **Fig. C**  **Fig. D**  **Fig. E**  **Fig. F**  **Fig. G**
4	Servo gain and offset adjustment	① Put a recrod on the turntable. ② Open the dustcover 1 or 2 cm, turn the power switch "on" and lower the tonearm. (In this case, do not allow the stylus to touch the disc.) ③ Connect the DC VTVM to the connector pin. **(See Fig. H)** ④ Make sure that VR301 has been completely turned clockwise. ⑤ Turn VR302 until the DC VTVM indicates 0.72V. **(Servo gain adjustment)** ⑥ Put a 1 mm-pitch record on the turntable, close the dust cover, and play the record. ⑦ Turn VR301 until the DC VTVM indicates 0.6V. **(Offset adjustment)**  **Fig. H**

■ MESSUNGEN UND JUSTIERUNGEN — Deutsch

• Justierung der Auto-Start-Position

(Für diese Justierung ist eine 30cm-Platte zu verwenden.)

1. Die Deckplatte abnehmen. **(Siehe "Entfernen der Deckplatte".)**
2. Überprüfen, daß der Tonarm in der Start-Position ist (am Außenrand des Plattentellers).
3. Den Schraubenzieher in das Justierloch einführen. **(Abb. 19)**
   - *Die Start-Position ist zu weit innen: Den Schraubenzieher entgegen dem Uhrzeigersinn drehen.
   - *Die Start-Position ist zu weit außen: Den Schraubenzieher im Uhrzeigersinn drehen.
4. Wenn die Start-Position noch immer von der korrekten Position abweicht, die Auto-Start-Position-Justierschraube drehen. **(Abb. 19)**
   - *Die Start-Position ist zu weit innen: Im Uhrzeigersinn drehen.
   - *Die Start-Position ist zu weit außen: Entgegen dem Uhrzeigersinn drehen.
5. Nach erfolgter Justierung muß die Justierschraube mit Lack gesichert werden.

• Justieren Sie die Auflagekraft in dem folgenden Fällen (Shiehe Abb. 20)

Die normale Auflagekraft beträgt 1,25g, doch kann sie um ± 0,25 g gesenkt oder erhöht werden.

Es könnte notwendig sein, die Auflagekraft zu erhöhen, wenn Plattern abgespielt werden, die bei hohem Pagel geschnitten wurden, wenn die Raumtemperatur tief ist, oder wenn der Plattenspieler externer Vibration ausgesetzt ist. Dies hilft dabei, Verzerrung und Überspringen der Rillen zu vermeiden.

Zum Justieren der Auflagekraft kann die Schraube nach links oder rechts gedreht werden, wie in der Skizze gezeigt. Die Schraube ist mit dem gradierten Ring gekoppelt.

Anmerkung:
Drehen Sie die Auflagekraft-Justierschraube nie weiter, als bis zu den Begrenzungen (1,5 g ~ 1,0 g).

• Reibungswinkel-Justierung des Tonarms und der Servo-Verstärkung

Nach der Reparatur des Tonarms und der Tonarm-Antriebsschaltung, sind die folgenden Justierungen durchzuführen.

Benötigte Werkzeuge und Instrumente

1. Elektronisches Gleichstrom-Röhrenvoltmeter oder Prüfgerät.
2. Platte mit 1mm-Rillenabstand.
3. Flachkopf-Schraubenzieher (klein).
4. Kreuzkopf-Schraubenzieher (Philips) (klein).
5. Sechskant-Schlüssel (M1,5).

Zustand des Gerätes

1. Die Staubabdeckung und die Plattentellerauflage entfernen. **(Siehe "Anleitung für die Zerlegung".)**
2. Den Deckelschalter (S307) durch Drücken mit Band einschalten. **(Abb. 21)**
3. Die Gehäuserückseite entfernen. **(Siehe "Anleitung für die Zerlegung".)**
4. Das obere Gehäuse vollständig öffnen und überprüfen, daß der Tonarm funktioniert, wenn die Start-Taste gedrückt wird.

Anmerkung: Der Tonarm funktioniert bei ausgebautem Plattenteller nicht.

Schritt	Einstell-Gegenstand	Justiermethode
1	**Justierung der Tonarm-Lifthöhe (Siehe Abb. A)**	① Den Netzschalter einschalten und den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen. ② Die Lifttaste drücken und überprüfen, daß der Abstand zwischen der Tonabnehmer-Nadelspitze und der Führungsschiene ca. 26mm beträgt. ③ Falls der Abstand nicht korrekt ist, die Lifthöhe durch Drehen der Justierschraube mit einem Flachkopf-Schraubenzieher justieren. – Bei zu großem Abstand: im Uhrzeigersinn drehen (> 26mm). – Bei zu kleinem Abstand: entgegen dem Uhrzeigersinn drehen (< 26mm). **Anmerkung:** Die Lifthöhe-Justierschraube des Ersatztonarms ist vollständig angezogen. Die Justierschraube ist daher vor dem Durchführen obiger Justierung zu lösen.
2	**Reibungswinkel-Justierung des Tonarms (Siehe Abb. B)**	① Den Netzschalter einschalten und den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen. ② Überprüfen, daß die Tonarmmitte mit der V-Kerbe der Liftachse übereinstimmt. ③ Überprüfen, daß der Tonarm parallel zum Tonarmträger ist. (Den Abstand zwischen Ⓐ und Ⓑ in **Abb. B** überprüfen.) ④ Falls der Tonarmträger nicht parallel zum Tonarm ist, durch Drehen der Reibungswinkel-Justierschraube justieren.
3	**Justierung der Tonarm-Empfindlichkeit**	① Den Netzschalter einschalten und den Tonarm durch Drücken der Start-Taste gegen die Plattenmitte bewegen. ② Die Lifttaste drücken und überprüfen, daß der Tonarm abgesenkt wird. ③ Das Gleichstrom-Röhrenvoltmeter an die Anschlußstifte anschließen. **(Siehe Abb. C und D)** ④ Die Spannungswerte bei ganz nach rechts und dann nach links gestelltem Tonarm ablesen. **(Siehe Abb. E und F)** ⑤ Vom Unterschied zwischen den beiden Spannungswerten die Mittelspannung berechnen. Zum Beispiel, wenn die Spannung in **Abb. E** 1.5V, und in **Abb. F** 0,02V beträgt: $\frac{(1{,}5V - 0{,}02V)}{2} + 0{,}02V = \mathbf{0{,}76V}$ (Mittelpunkt-Spannung) ⑥ Den Tonarm in die Mittelposition stellen, und die Justierschraube der Armbasis mit dem Sechskantschlüssel drehen, bis die Mittelspannung erreicht wird. **(Siehe Abb. G)**
4	**Servo-Verstärkungs- und Reibungswinkel-Justierung**	① Eine Platte auf den Plattenteller legen. ② Die Staubabdeckung 1 oder 2 cm öffnen, den Netzschalter einschalten und den Tonarm absenken. (In diesem Fall darauf achten, daß die Abtastnadel die Platte nicht berührt.) ③ Das Gleichstrom-Röhrenvoltmeter an die Steckerstifte anschließen. ④ Überprüfen, daß VR301 bis zum Anschlag im Uhrzeigersinn gedreht worden ist. ⑤ VR302 drehen, bis das Gleichstrom-Röhrenvoltmeter, 0,72V anzeigt. **(Servo-Verstärkungs-Justierung)** ⑥ Die Platte mit 1mm-Rillenabstand auf den Plattenteller auflegen, die Staubabdeckung schließen, und die Platte abspielen. ⑦ VR301 drehen, bis das Gleichstrom-Röhrenvoltmeter 0,6V anzeigt. **(Reibungswinkel-Justierung)**

■ MESURAGES ET MISES AU POINT Français

• Mise au point du démarrage automatique

(Utiliser un disque de 30 cm pour cette mise au point.)

1. Enlever la plaque ornementale. **(Se référer aux "Instructions pour le Démontage".)**
2. S'assurer que le bras de lecture est sur la position de démarrage (la périphérie la plus à l'extérieure de la platine).
3. Insérer le tournevis dans le trou de réglage. **(Fig. 19)**
   - *La position de démarrage est trop à l'intérieur: Tourner le tournevis dans le sens inverse des aiguilles d'une montre.
   - *La position de démarrage est trop à l'extérieur: Tourner le tournevis dans le sens des aiguilles d'une montre.
4. Si la position de démarrage est encore déviée, tourner la vis de mise au point du démarrage automatique. **(Fig. 19)**
   - *La position de démarrage est trop à l'intérieur: La tourner dans le sens des aiguilles d'une montre.
   - *La position de démarrage est trop à l'extérieur: La tourner dand le sens inverse des aiguilles d'une montre.
5. Après la mise au point, s'assurer de bloquer la vis de mise au point avec un adhésif.

• Mettre au point la force verticale d'appui de la pointe de lecture dans les cas suivants. (Voir Fig. 20.)

La force verticale d'appui de la pointe de lecture est normalement réglée sur 1,25 g, mais elle peut être augmentée ou diminuée de ± 0,25 g.

Il pourra être nécessaire d'augmenter la force verticale d'appui de la pointe lorsqu'on joue des disques enregistrés à des niveaux élevés, ou lorsque le température de la piéce est basse, ou encore lorsque l'appareil capte facilement des vibrations extérieures. Cela aidera à empêcher une distorsion et un sautillement des sillons. Pour régler cette force verticale d'appui de la pointe de lecture, tourner la vis de réglage d'un côte ou de l'autre, comme il est montré sur le schéma. La vis est couplée avec la bague graduée.

Nota:

Ne pas tourner lar vis de réglage de la force verticale d'appui de la pointe de lecture plus que les limites de réglage admissibles (1,5 ~ 1,0 g).

• Mise au point du décalage du bras de lecture et de l'amplification servo-mécanique

Après la révision du bras de lecture et du circuit d'entraînement du bras, effectuer la mise au point suivante selon la procédure ci-dessous.

Outils et équipement à utiliser:

1. Vérificateur ou voltmètre électronique (VTVM) à C.C.
2. Disque à écarts de 1 mm.
3. Tournevis à tête plate (petit).
4. Tournevis à tête Philips (petit).
5. Clef hexagonale (M1,5).

Conditions du réglage:

1. Retirer le couvercle protège-poussière et la plaque de surface. **(Se référer aux "Instructions pour le Démontage".)**
2. Mettre "en marche" le commutatuer (S307) du couvercle en appuyant dessus avec un ruban. **(Fig. 21)**
3. Retirer le capot arrière. **(Se référer aux "Instructions pour le Démontage".)**
4. Ouvrir complètement le boîtier supérieur et s'assurer que le bras de leture fonctionne lorsqu'on appuie sur la touche de démarrage.

   Nota: Le bras de lecture ne fonctionne pas lorsque la platine est retirée.

Etape	Article	Méthode de réglage
1	**Mise au point de la hauteur d'élévation du bras (Voir Fig. A)**	① Mettre "en marche" l'interrupteur d'alimentation et déplacer le bras de lecture vers le centre du disque en appuyant sur la touche de démarrage. ② Appuyer sur la touche de pose/relevage pour vérifier si l'intervalle entre la pointe de lecture de la cellule pick-up et le rail de guidage est d'à peu près 26 mm. ③ Si l'intervalle n'est pas suffisant, ajuster la hauter d'élévation en tournant la vis de réglage avec un tournevis à tête plate. – Tourner dans le sens des aiguilles d'une montre si l'intervalle est excessif (> 26 mm). – Tourner dans le sens inverse des aiguilles d'une montre si l'intervalle est insuffisant (< 26 mm). **Nota:** La vis de réglage de la hauteur d'élévation du bras de lecture de rechange est serrée à fond. Aussi, la desserrer avant d'effectuer la mise au point ci-dessus.
2	**Mise au point de l'angle de décalage du bras de lecture (Voir Fig. B)**	① Mettre "en marche" l'interrupteur d'alimentation et déplacer le bras de lecture vers le centre du disque en appuyant sur la touche de démarrage. ② S'assurer que le centre du bras soit aligné avec l'encoche en V du levier d'élévation. ③ S'assurer que le socle du bras soit parallèle au bras. (Vérifier l'intervalle entre Ⓐ et Ⓑ dans la **Fig. B**) ④ Si le socle du bras n'est pas parallèle au bras, l'ajuster en tournant la vis de réglage de l'angle de décalage.
3	**Mise au point de la sensibilité du bras du lecture**	① Mettre "en marche" l'interrupteur d'alimentation et déplacer le bras de lecture vers le centre du disque en appuyant sur la touche de démarrage. ② Appuyer sur la touche de pose/relevage et s'assurer que le bras soit abaissé. ③ Brancher le voltmètre électronique à C.C. à la broche du connecteur. **(Voir les Figs. C et D)** ④ Observer les valeurs de tension avec le bras de lecture complètement orienté respectivement vers la droite et la gauche. **(Voir les Figs. E et F)** ⑤ Calculer la tension moyenne à partir de la différence entre les deux valeurs de tension. Par exemple, lorsque la tension est de 1,5V dans la **Fig. E** et de 0,02V dans la **Fig. F**, alors: $\frac{(1{,}5V - 0{,}02V)}{2} + 0{,}02V = \mathbf{0{,}76V}$ (tension du point intermédiaire) ⑥ Placer le bras de lecture sur la position du centre, et tourner la vis de réglage du socle du bras avec une clef kexagonale jusqu'à ce que la tension médiane soit obtenue. **(Voir Fig. G)**
4	**Mise au point du décalage et de l'amplification servomécanique**	① Placer un disque sur la platine. ② Ouvrir le couvercle protège-poussière de 1 à 2 cm, mettre "en marche" l'interrupteur d'alimentation et abaisser le bras de lecture. (Dans ce cas, ne pas laisser la pointe de lecture toucher le disque.) ③ Brancher le voltmètre électronique à C.C. à la broche du connecteur. ④ S'assurer que VR301 à été entièrement tourné dans le sens des aiguilles d'une montre. ⑤ Tourner VR302 jusqu'à ce que le voltmètre électronique à C.C. indique 0,72V. **(Mise au point de l'amplification servo-mécanique.)** ⑥ Placer un disque à écarts de 1 mm sur la platine, refermer le couvercle protège-poussière et faire jouer le disque. ⑦ Tourner VR301 jusqu'aà ce que le voltmètre électronique à C.C. indique 0,6V. **(Mise au point du décalage.)**

REPLACEMENT PARTS LIST...Cabinet & Chassis Parts

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components indentified by ⚠ make have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ-marked parts are used for black type only, while ○-marked parts are for silver type only.
4. Parts other than Ⓚ and ○-marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Black type model No. : SL-QL1 (K)

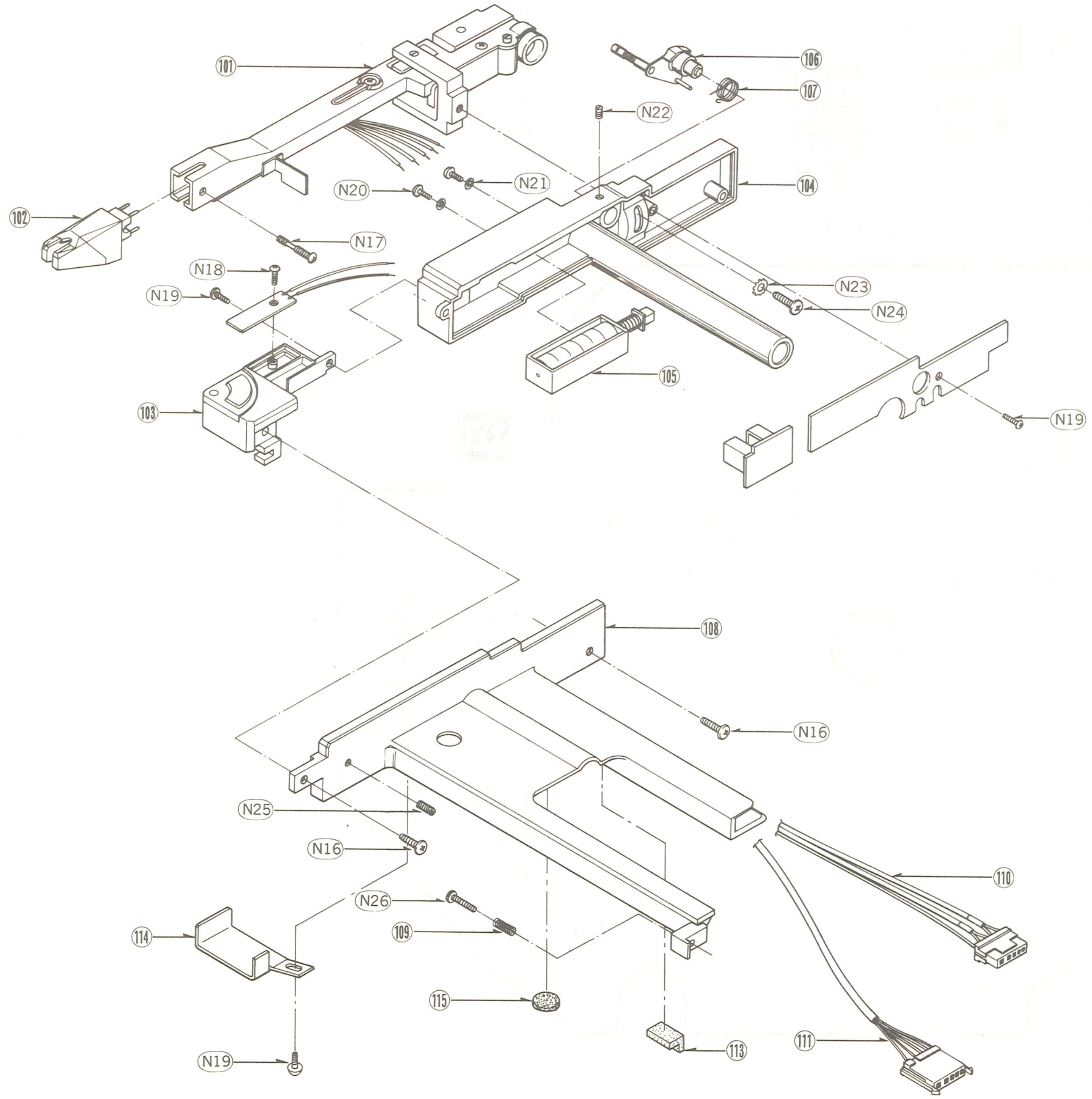
Ref. No.		Part No.	Part Name & Description
MAIN CABINET PARTS			
1		SFTGQ11N01	Turntable Mat
2		SFTEQ11N01A	Turntable
3	Ⓚ	SFACQ11N01	Cabinet (Silver)
3		SFACQ11N03	Cabinet (Black)
4		SFUMQ11N11	Rear Cover
5 [E] only		SFNNQ11S01	Name Plate
5 [EK],[XL]		SFNNQ11G01	Name Plate
5 [EG],[EB],[EF] [EH],[EI]		SFNNQ11R01	Name Plate
5 [XA] only		SFNNQ11X01	Name Plate
6		SFDJQ11N05E	Connector, 3 Pin (With Wire)
7		SFKKQ11N01	Surface Plate
8		SFUMQ11N09	Spacer Strobe
9		SFUMQ11N15	Spacer, Strobe L.E.D.
10		SFDJQ11N06E	Connector, 2 Pin (With Wire)
11		SFUMQ11N01E	Guide (A), Operation Knob
12		SFUMQ11N03	Guide (B), Speed Selector Knob
13		SFKTQ11N03	Knob, Speed Selector
14		SFKTQ11N04	Knob, Power
15		SFUMQ11N06	Shaft, Power Switch Knob
16		SFUPQ11N04	Bracket, Power Switch Knob
17		SFUMQ11N05	Joint Rod, Power Switch
18		SFDJQ11N02E	Connector, 6 Pin (With Wire)
19		SFGCC07–06	Cushion, Power Transformer
20		SFUPQ11N09	Cover, Power Transformer
21		SFUMC07–08	Spacer, Disc Size Detect L.E.D.
22		SFDJC07–05E	Connector, 2 Pin (With Wire)
23		SFAUQ11N01E	Bottom Board
24		SFQCC07–01	Spring (Front), Audio Insulator
25	⚠	SFQCQ11N01	Spring (Rear), Audio Insulator
	⚠		
26	⚠	SFGAC07–01E	Audio Insulator
27		**SJA88**	AC Cord
27 [EK] only		**QFC1205M**	AC Cord
27 [XL] only		**QFC1208M**	AC Cord
28		SFUM190–11	Clamper, AC Cord
28 [XL] only		SFUM190–12	Clamper, AC Cord
29		SFDHC07–01A	Phono Cord
30		SFMZQ11N01Z	Stator Fram
31		SFDJQ11N01E	Connector, 8 Pin (With Wire)
32		SFUZQ11N03	Shield Plate
33		SFDJQ11N04E	Connector, 5 Pin (With Wire)
34		SFDFQ11N01	Plate, Power Transistor
35		SFDCC07–01	Sheet, Power Transistor
36		SFDBC07–01	Bushing
37		SFDSTWM9901A	Switch, Power Switch
38		SFUM190–11	Clamper, Phono Cord
39		SFGZQ11N01	Spacer, L.E.D. (D325, 328, 329)
40		SFGZQ11N02	Spacer, L.E.D. (D321 ~ 324)
UPPER CABINET PARTS			
50		SFUMQ11N12	Upper Cabinet Cover
51		SFNZC07M01	Lable, Disc Size Selector
52		SFUPQ11N08	Guide, Upper Cabinet Cover
53		SFUMC07–16	Shutter
54		SFGCQ11N01	Cushion (A), Guide Rail (A)
55		SFXJQ11N01	Guide Rail (A), Tonearm
56		SFUPC07–04	Supporter (A), Guide Rail (A)
57		SFUPQ11N03	Guide Rail (B), Upper Cabinet
58		SFUPQ11N05	Supporter (B), Guide Rail (B)
59		SFGCQ11N02	Cushion (B), Guide Rail (B)
60	○	SFACQ11N02	Upper Cabinet (Silver)
60	Ⓚ	SFACQ11N04	Upper Cabinet (Black)
61		SFADQ11N01E	Dust Cover
62		SFUMC07–19	Guide, Lead Wire
63		SFKKQ11N02	Surface Plate
64	○	SFATQ11N01A	Hing (Silver)
64	Ⓚ	SFATQ11N02A	Hing (Black)
65		SFUPC07–01E	Arm Drive Plate
66		SFUPC07–07	Clamper, Lead Wire
67		SFUMC07–23	Pulley
68		SFUMC07–22	Stopper, Pulley
69		SFUMC10–05	Arm Drive Wheel
70		SFDJC10–02E	Connector, 4 Pin (With Wire)
71		SFXZC07–01R	Worm Ass'y
72		SFGBC10–01	Belt, Arm Drive
73		SFUZC07–05E	Arm Drive Rope
74		SFMHC07–01E	Arm Drive Motor
75		SFGCQ11N03	Cushion, Arm Drive Motor
76		SFUPQ11N15	Supporter, Arm Drive Motor
77		SFDJQ11N03E	Connector, 12 Pin (With Wire)
78		SFUZQ11N02	Lable, Surface Plate
TONEARM PARTS			
101		SFPAM00701A	Tonearm
102		EPCP22SK	Cartridge
		EPS22ES	Stylus
103		SFPCS00701A	Tonearm Position Indicator
104		SFPKD00701E	Arm Base
105		SFDZC07–01E	Cueing Plunger (RL501)
106		SFPJL00701A	Lift Ass'y
107		SFPSP01505	Spring, Lift Ass'y
108		SFPKD00702	Arm Base Cover
109		SFPSP00706	Spring, Rest Position Adjustment
110		SFDJC07–03E	Connector, Phono (With Wire)
111		SFDJC07–02E	Connector, 5 Pin (With Wire)
113		SFPGM00702	Cushion, Lead Wire
114		SFPZB00709	Bracket, Arm Base
115		SFGZ172–01	Spacer, Arm Base Cover
SCREWS, WASHERS and CIRCUITS			
N1		**XTV3+8BFN**	Screw, Tapping, ⊕ 3 x 8
N2		**XTV3+8BFZ**	Screw, Tapping, ⊕ 3 x 8
N3		SFXGQ20–01	Screw, Insulator
N4		XYE3+EJ8	Screw, Tapping, ⊕ 3 x 8
N5		XYN3+C8	Screw, ⊕ 3 x 8
N6		SFXWQ11N02	Washer, Insulator
N7		**XTV3+6BFN**	Screw, Tapping, ⊕ 3 x 6
N8		**XTS26+6B**	Screw, Tapping, ⊕ 2.6 x 6
N9		SFXGQ11N01	Screw, Dust Cover
N10		SFXWQ11N01	Washer, Dust Cover
N11		**XTV3+16BFZ**	Screw, Tapping, ⊕ 3 x 16
N12		SFXW551D2	Washer, Arm Drive Wheel
N13		**XUC3FT**	Circlip, Arm Drive Wheel
N14		XYN23+C10BN	Screw, ⊕ 2.3 x 10
N15		XYC4+CJ20FZ	Screw, Tapping, ⊕ 4 x 20
N16		**XTN3+8BFZ**	Screw, Tapping, ⊕ 3 x 8
N17		SFPEV00701	Screw, Cartridge
N18		XTN3+4B	Screw, Tapping, ⊕ 3 x 4
N19		**XTN23+6BFZ**	Screw, Tapping, ⊕ 2.3 x 6
N20		**XSN2+4BV**	Screw, ⊕ 2 x 4
N21		**XWA2BFZ**	Washer, Spring, $\phi 2$
N22		XXE3D2FZS	Screw, Lift Ass'y
N23		**XWC3B**	Washer, External Toothed Lock $\phi 3$
N24		**XSN3+8S**	Screw, ⊕ 3 x 8
N25		XXE3D6FZS	Screw, Offset Angle Adjustment
N26		SFXGC10–06	Screw, Rest Position, Adjustment
N27		SFXWQ11N04	Washer, Dust Cover
N28		SFXWQ11N05	Washer, Upper Cabinet Cover

Ref. No.		Part No.	Part Name & Description
ACCESSORIES			
A1 [E] only		SFNUQ11S01	Instructions Book, Printed Matter
A1 [EK] only		SFNUQ11G01	Instructions Book, Printed Matter
A1		SFNUQ11X01	Instructions Book, Printed Matter
A2		SFWE212–01	45 Adaptor
A3		SFCZB30001	Brush
A4		SFWTC07–01	Screw Driver
A5 [XA] only		SFDKI19118	2 Pin Plag
PACKING PARTS			
P1	○	SFHPQ11M01	Carton Box, (Silver)
P1 [EF] only	○	SFHPQ11C01	Carton Box (Silver)
P1	Ⓚ	SFHPQ11M21	Carton Box, (Black)
P2		SFHHQ11N01	Pad, Front
P3		SFHHQ11N02	Pad, Rear
P4		SFHDQ11N01	Pad, Top
P5		SFHSQ11N01E	Spacer, Tonearm
P6		SFHSQ11N02	Spacer, Dust Cover
P7		SFYH60X60	Polyethylene Bag, Unit
P8		SFYH40X45	Polyethylene Bag, Turntable
P9		SFYF09A15	Polyethylene Bag, Accessories
P10 [XA] only		SFHSC07–02	Spacer (A), Corner
P11 [XA] only		SFHSC07–03	Spacer (B), Corner

Areas

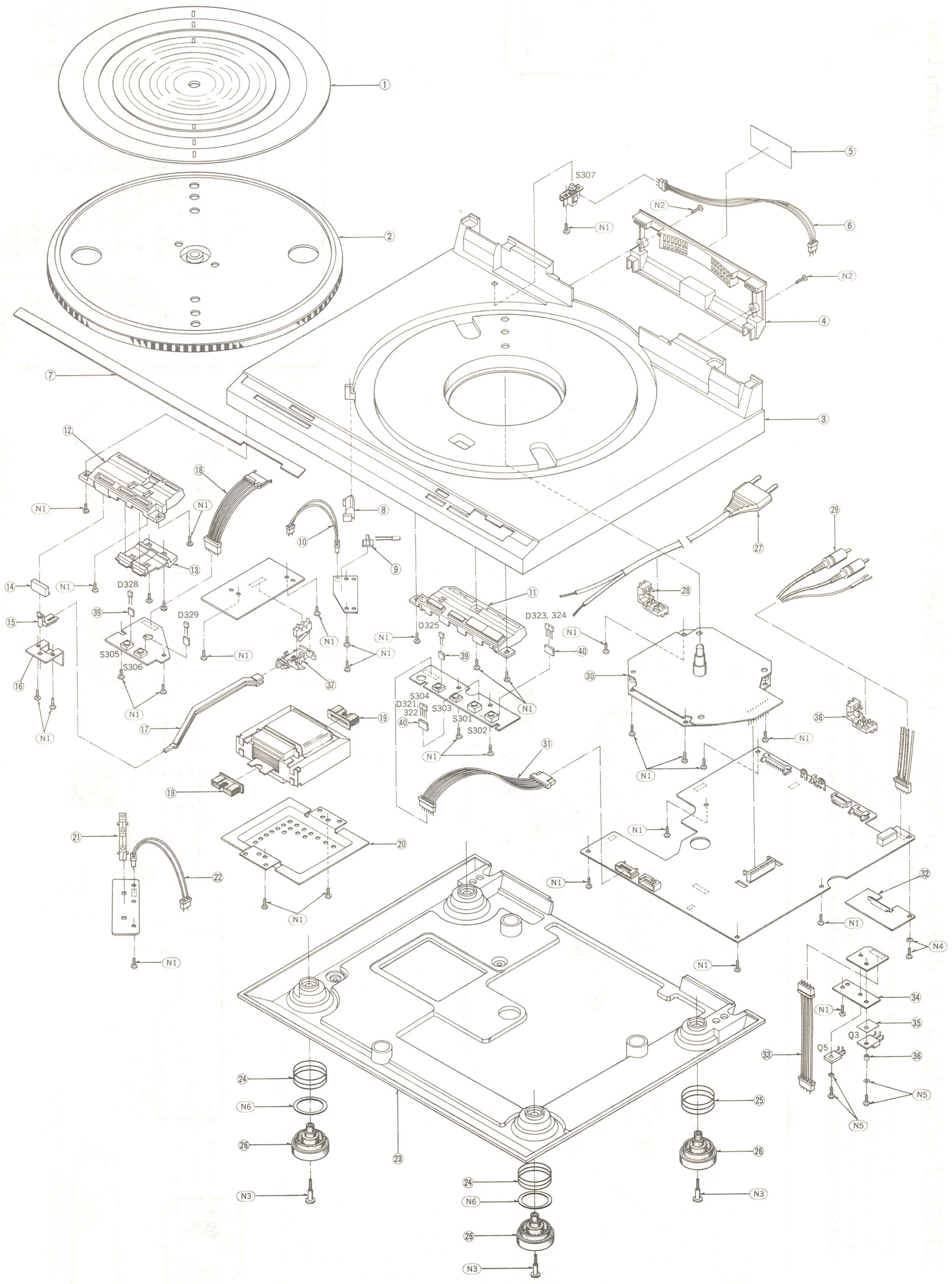
* [E] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [XL] is available in Australia.
* [EF] is available in France.
* [EB] is available in Belgium.
* [EG] is available in F.R. Germany.
* [EI] is available in Italy.
* [EH] is available in Holland.
* [XA] is available in East South Asia, Oceania, Africa, Middle Near East and Central South America.

■ EXPLODED VIEW......Tonearm



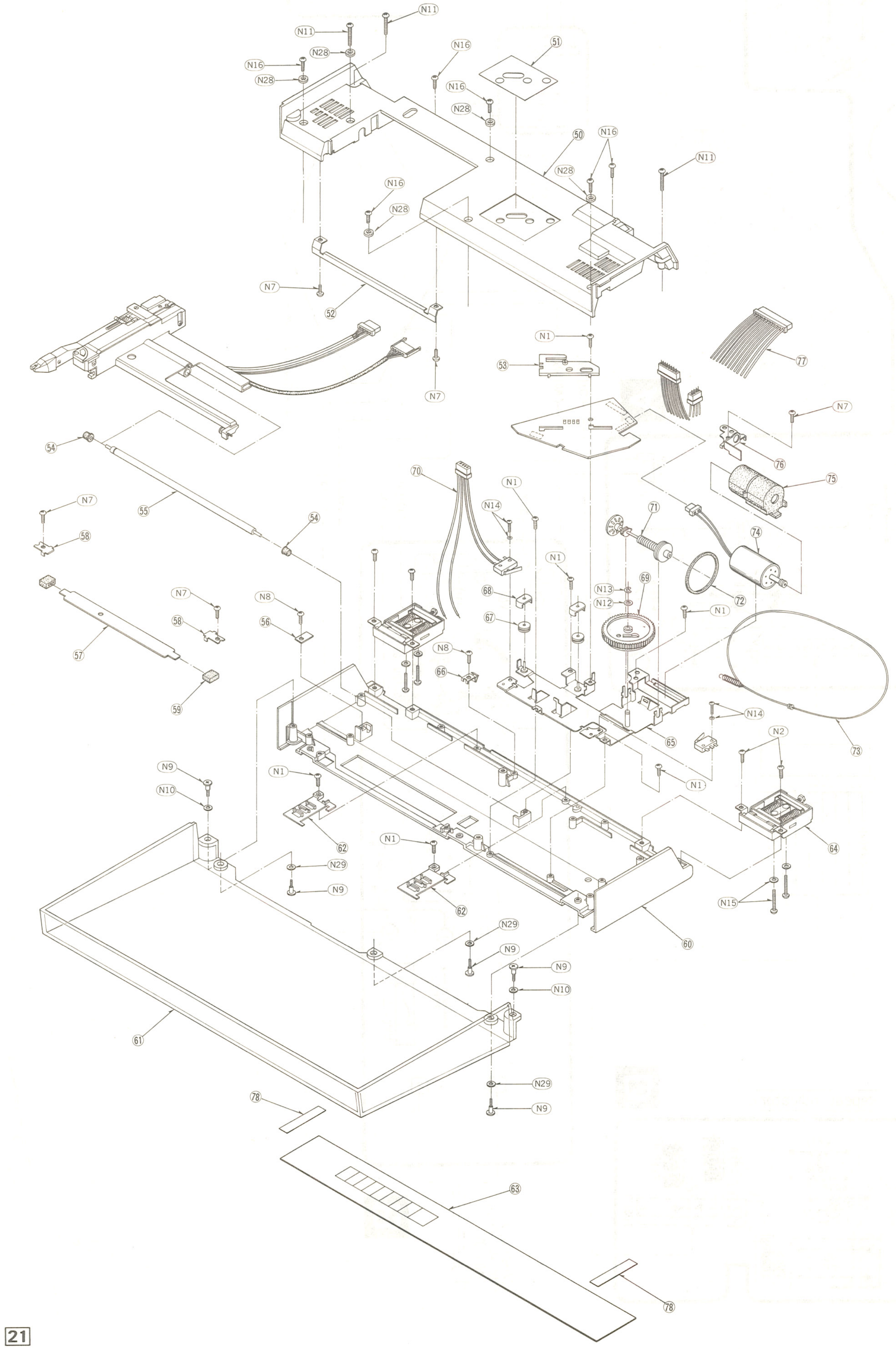
101
106
107
N22
102
N20
N21
104
N17
N18
N19
N23
N24
105
103
N19
108
N16
N25
N16
110
N26
114
109
115
113
111
N19

■ EXPLODED VIEW......Main Cabinet



①
⑤
S307
N1
N2
⑥
②
N2
④
⑦
③
⑫
⑱
N1
N1
⑧
⑩
⑨
㉗
㉙
⑬
⑭
N1
D328
⑪
D323, 324
㉘
⑮
39
D329
D325
N1
40
N1
S305
S306
N1
N1
N1
37
39
⑯
S304
D321, 322
S303
S301
S302
40
N1
30
N1
⑲
N1
⑰
31
38
N1
N1
⑲
㉑
⑳
N1
㉒
32
N1
N1
N1
N4
N1
N1
34
35
Q3
Q5
36
33
N5
N5
㉔
N6
㉕
㉖
㉖
㉓
N3
N3
㉔
N6
㉖
N3

■ EXPLODED VIEW......Upper Cabinet



■ REPLACEMENT PARTS LIST...Electrical Parts

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components indentified by ⚠ make have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Ref. No.		Part No.	Part Name & Description
INTEGRATED CIRCUITS			
IC101		AN6635	IC, Drive
IC201		AN6680	IC, Control
IC301		MN1400PE	IC, Micro-Computer
IC302		SVIM53200P	IC, Nand Gate
IC303		SVIM53217P	IC, Buffer
IC304		SVIM53216P	IC, Inverter
IC305		AN6914	IC, Compareter
IC306		SVIBA6109	IC, Arm Motor Drive
TRANSISTORS			
Q1, 102		2SD636	Transistor, Regulator & Drive Detector
Q2		2SD638	Transistor, Regulator
Q3		2SC1826	Transistor, Regulator
Q4, 101		2SB641	Transistor, Regulator & Drive Detector
Q5		2SC1846–R	Transistor, Regulator
Q201, 203		2SD636	Transistor, Regulator & Switching
Q202		**2SC1328–T**	Transistor, FG Amplifier
Q301, 302		2SD636	Transistor, Switching
Q303 ~ 305		SVTPH101–Q2	Photo Transistor, Disc Size Detector
Q306, 308		2SD636	Transistor, Buffer
Q307, 309		2SD638	Transistor, Buffer
Q310		2SB641	Transistor, Switching
Q311, 312		2SD636	Transistor, Offset & Servo Amplifier
Q313, 315		2SD638	Transistor, Cueing Relay Driver
Q314, 316 ~ 319		2SD636	Transistor, Switching & Muting Relay Driver
Q331, 332		2SB641	Transistor, Switching
DIODES			
D1	⚠	SVDSIRBA20Z	Diode, Rectifier
D2		MA1051A	Diode, 5.1V Zener
D101, 201, 334 301 ~ 307, 502, 309 ~ 311, 333		**MA162A**	Diode
D103		**RVDRD6R8EB**	Diode, 6.8V Zener
D202		SVDGD4205ALC	Light Emitting Diode, Strobe
D308		**MA26TO–A**	Diode
D102, 312, 313 326, 327		**20A90**	Diode
D321 ~ 325 328, 329		SVDPR5531K	Light Emitting Diode, Red
D330 ~ 332		SVDAR3402S	Light Emitting Diode, Disc Size Detector
D501		SVDEBR3432S	Light Emitting Diode, Arm Indicator
PHOTO INTERRUPTERS			
PC301		ON1161	Photo Interrupter, Arm Position Detector
PC501		ON1108	Photo Interrupter, Offset Angle Detector
HALL ELEMENT			
H1, 2		H–300A	Hall Element, Turntable Position Detector
CRYSTAL			
X201		SVQU306115	Crystal, 4.19328MHz Counter Oscillator
RELAY			
RL301		SFDYQ11N01	Relay, Muting
RL501		SFDZC07–01E	Plunger, Cueing
SWITCHES			
S301, 302		EVQQBR08K	Switch, Start & Stop
S303 ~ 306		EVQQQB04K	Switch, Repeat Cueing & Speed Selector
S307		ESB6247	Switch, Reset Switch

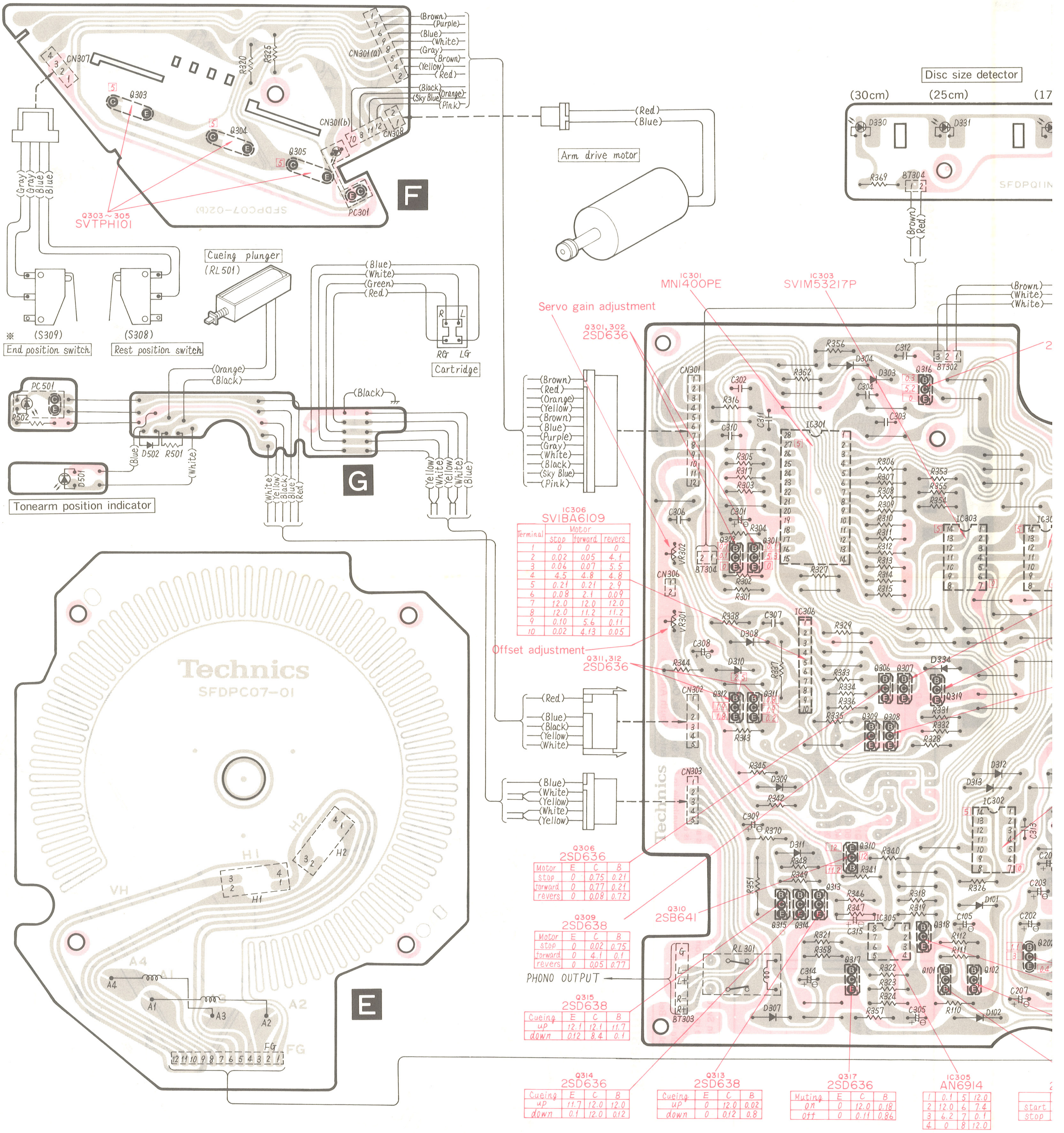
Ref. No.		Part No.	Part Name & Description
S308, 309		SFDSD2MSL–4	Switch, Rest & End Detector
S401	⚠	SFDSSS5GLS	Switch, Power Source
S402	⚠	SFDSHXW01317	Switch, Voltage Adjuster
VARIABLE RESISTORS			
VR301		**EVNM0AA00B14**	Offset Adjustment, 10kΩ (B)
VR302		**EVNM0AA00B13**	Servo Gain Adjustment, 1kΩ (B)
TRANSFORMER			
T1	⚠	SLT66PS5E	Transformer, Power Source
FUSE			
F1	⚠	XBAS2C025T1A	Fuse, 250V, 250mA
F2	⚠	XBA2C10TR0	Fuse, 250V, 1A
RESISTORS			
R1		**ERD25FJ562**	Carbon, 5.6kΩ, 1/4W, ± 5%
R2		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R3, 4		**ERD25FJ562**	Carbon, 5.6kΩ, 1/4W, ± 5%
R5		**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R6		**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ± 5%
R101		**ERX1ANJ1R5**	Metal Film, 1.5Ω, 1W, ± 5%
R102		**ERD25FJ562**	Carbon, 5.6kΩ, 1/4W, ± 5%
R103		**ERD25FJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%
R106		**ERD25FJ271**	Carbon, 270Ω, 1/4W, ± 5%
R107		**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%
R108, 109		**ERD25FJ101**	Carbon, 100Ω, 1/4W, ± 5%
R110		**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%
R111		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R112		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R201		**ERD25FJ331**	Carbon, 330Ω, 1/4W, ± 5%
R202		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R203		**ERD25FJ470**	Carbon, 47Ω, 1/4W, ± 5%
R204		**ERD25FJ272**	Carbon, 2.7kΩ, 1/4W, ± 5%
R205		**ERD25TJ124**	Carbon, 120kΩ, 1/4W, ± 5%
R206		**ERD25FJ391**	Carbon, 390Ω, 1/4W, ± 5%
R207		**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ± 5%
R208		**ERD25TJ224**	Carbon, 220kΩ, 1/4W, ± 5%
R209		**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ± 5%
R210		**ERD25FJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R211, 212		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R213		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R214		**ERD25FJ471**	Carbon, 470Ω, 1/4W, ± 5%
R215		**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ± 5%
R216		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R217		**ERD25FJ471**	Carbon, 470Ω, 1/4W, ± 5%
R218		**ERD25FJ181**	Carbon, 180Ω, 1/4W, ± 5%
R219		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R220		**ERD25FJ272**	Carbon, 2.7kΩ, 1/4W, ± 5%
R221		**ERD25FJ181**	Carbon, 180Ω, 1/4W, ± 5%
R301		**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ± 5%
R302		**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R303		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R304		**ERD25FJ150**	Carbon, 15Ω, 1/4W, ± 5%
R305		**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R306, 307		**ERD25FJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%
R308, 309		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R310, 311		**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%
R312		**ERD25FJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%
R313, 314		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R315, 316		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R317		**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%
R318		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R319		**ERD25FJ101**	Carbon, 100Ω, 1/4W, ± 5%
R320		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%

Continued on page 29

■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

▨ Ground (Earth) Lines

* S309 (end detection switch) will be replaced by MN1400PE of which the end detection unit is built into MN1400PA (IC301) in the course of manufacture.
At the time of servicing, it is possible to replace MN1400PA with MN1400PE, but not MN1400PE with MN1400PA. Incidentally, MN1400PE will be supplied as repair parts.


F
CN307
Q303
Q304
Q305
R320
R325
CN301(a)
CN301(b)
CN308
PC301
Q303～305
SVTPH101
SFDPC07-02(b)
(Brown)
(Purple)
(Blue)
(White)
(Gray)
(Brown)
(Yellow)
(Red)
(Black)
(Sky Blue)
(Orange)
(Pink)
(Red)
(Blue)
Arm drive motor
Disc size detector
(30cm)
(25cm)
D330
D331
R369
BT304
SFDPQ11N
(Gray)
(Gray)
(Blue)
(Blue)
Cueing plunger
(RL501)
※ (S309)
End position switch
(S308)
Rest position switch
(Blue)
(White)
(Green)
(Red)
R
L
RG
LG
Cartridge
(Orange)
(Black)
PC501
R502
D502
R501
(Black)
G
D501
Tonearm position indicator
IC301
MN1400PE
IC303
SVIM53217P
Servo gain adjustment
Q301, 302
2SD636
Offset adjustment
Q311, 312
2SD636
Q310
2SB641
PHONO OUTPUT
Technics
SFDPC07-01
H1
H2
VH
A1
A2
A3
A4
FG
E
CN301
CN302
CN303
CN306
VR301
VR302
IC302
IC305
IC306
RL301
BT302
BT303

IC306
SVIBA6109

Terminal	Motor		
	stop	forward	revers
1	0	0	0
2	0.02	0.05	4.1
3	0.06	0.07	5.5
4	4.5	4.8	4.8
5	0.21	0.21	2.9
6	0.08	2.1	0.09
7	12.0	12.0	12.0
8	12.0	11.2	11.2
9	0.10	5.6	0.11
10	0.02	4.13	0.05

Q306
2SD636

Motor	E	C	B
stop	0	0.75	0.21
forward	0	0.77	0.21
revers	0	0.08	0.72

Q309
2SD638

Motor	E	C	B
stop	0	0.02	0.75
forward	0	4.1	0.1
revers	0	0.05	0.77

Q315
2SD638

Cueing	E	C	B
up	12.1	12.1	11.7
down	0.12	8.4	0.1

Q314
2SD636

Cueing	E	C	B
up	11.7	12.0	12.0
down	0.1	12.0	0.12

Q313
2SD638

Cueing	E	C	B
up	0	12.0	0.02
down	0	0.12	0.8

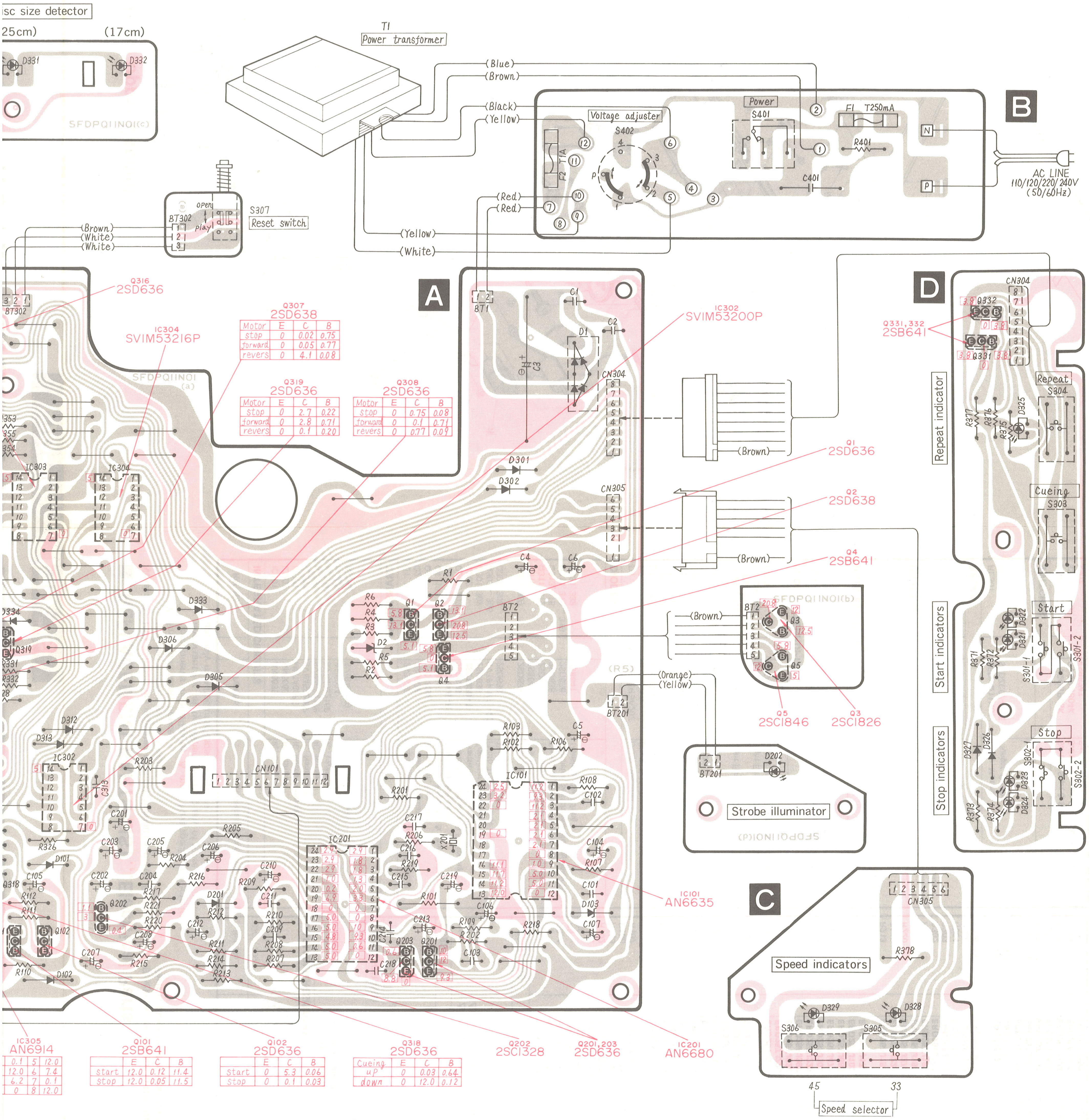
Q317
2SD636

Muting	E	C	B
on	0	12.0	0.18
off	0	0.11	0.86

IC305
AN6914

1	0.1	5	12.0
2	12.0	6	7.4
3	6.2	7	0.1
4	0	8	12.0

start
stop



isc size detector
25cm)
(17cm)
D331
D332
SFDPQ1INOI(c)
T1
Power transformer
(Blue)
(Brown)
(Black)
(Yellow)
Voltage adjuster
S402
Power
S401
F1 T250mA
R401
C401
B
N
P
AC LINE
110/120/220/240V
(50/60Hz)
(Red)
(Red)
(Yellow)
(White)
S307
Reset switch
BT302
open
play
(Brown)
(White)
(White)
A
Q316
2SD636
IC304
SVIM53216P
SFDPQ1INOI(a)
IC302
SVIM53200P
BT1
C1
C2
D1
C3
CN304
D301
D302
CN305
D
Q331, 332
2SB641
Repeat indicator
Repeat
S304
Cueing
S303
Start indicators
Start
S301-1
S301-2
Stop indicators
Stop
S302-1
S302-2
(Brown)
Q1
2SD636
Q2
2SD638
Q4
2SB641
SFDPQ1INOI(b)
BT2
Q3
Q5
2SC1846
2SC1826
(R5)
(Orange)
(Yellow)
BT201
D202
Strobe illuminator
SFDPQ1INOI(d)
IC303
IC302
IC101
IC201
CN101
IC101
AN6635
C
CN305
R378
Speed indicators
D329
D328
S306
S305
45
33
Speed selector
IC201
AN6680
Q202
2SC1328
Q201, 203
2SD636

Q307
2SD638

Motor	E	C	B
stop	0	0.02	0.75
forward	0	0.05	0.77
revers	0	4.1	0.08

Q319
2SD636

Motor	E	C	B
stop	0	2.7	0.22
forward	0	2.8	0.71
revers	0	0.1	0.20

Q308
2SD636

Motor	E	C	B
stop	0	0.75	0.08
forward	0	0.1	0.71
revers	0	0.77	0.09

IC305
AN6914

0.1	5	12.0
12.0	6	7.4
6.2	7	0.1
0	8	12.0

Q101
2SB641

	E	C	B
start	12.0	0.12	11.4
stop	12.0	0.05	11.5

Q102
2SD636

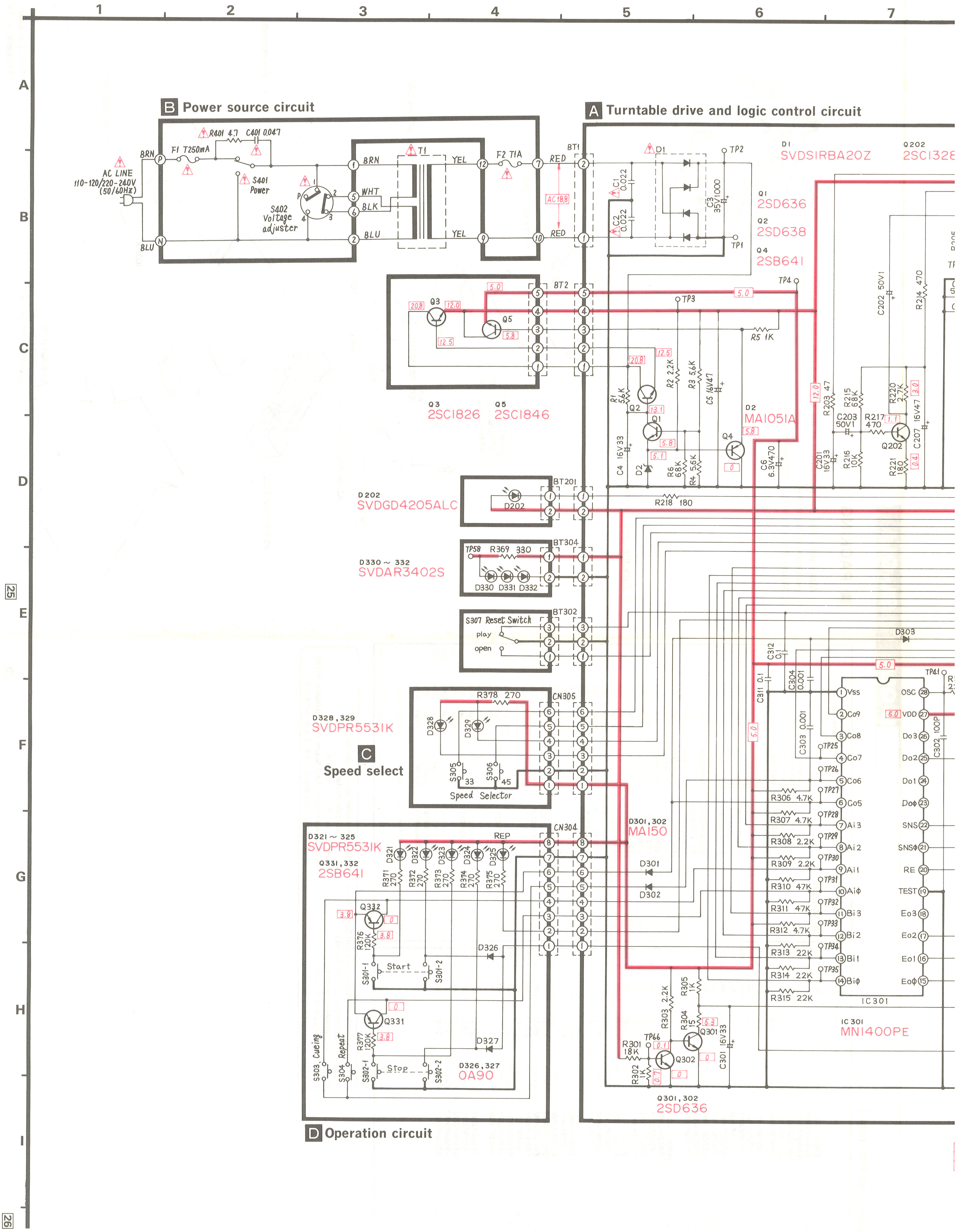
	E	C	B
Start	0	5.3	0.06
Stop	0	0.1	0.03

Q318
2SD636

Cueing	E	C	B
up	0	0.03	0.64
down	0	12.0	0.12

■ SCHEMATIC DIAGRAM

(This schematic diagram may be at any time with the development of new technology.)



1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
B Power source circuit
A Turntable drive and logic control circuit
AC LINE 110-120/220-240V (50/60Hz)
BRN
BLU
P
N
F1 T250mA
R401 4.7
C401 0.047
S401 Power
S402 Voltage adjuster
T1
BRN
WHT
BLK
BLU
YEL
YEL
F2 T1A
RED
RED
BT1
AC18.8
C1 0.022
C2 0.022
D1
C3 35V1000
TP2
TP1
D1 SVDS1RBA20Z
Q202 2SC1328
Q1 2SD636
Q2 2SD638
Q4 2SB641
TP4
TP3
5.0
BT2
Q3
Q5
20.8
12.0
12.5
5.8
Q3 2SC1826
Q5 2SC1846
R5 1K
R1 5.6K
R2 2.2K
R3 5.6K
C5 16V47
20.8
12.5
13.1
Q2
Q1
5.8
5.1
Q4
0
C4 16V33
D2
R6 68K
R4 5.6K
C6 6.3V470
D2 MA1051A
5.8
12.0
R203 47
R215 68K
R220 2.7K
C203 50V1
R217 470
1.1
C207 16V47
3.0
Q202
C201 16V33
R216 10K
R221 180
0.4
C202 50V1
R214 470
D202 SVDGD4205ALC
D202
BT201
R218 180
D330 ~ 332 SVDAR3402S
TP58
R369 330
D330 D331 D332
BT304
BT302
S307 Reset Switch
play
open
D303
C312 0.1
C304 0.001
C311 0.1
C303 0.001
5.0
TP41
1 Vss
2 Co9
3 Co8
4 Co7
5 Co6
6 Co5
7 Ai3
8 Ai2
9 Ai1
10 Aiφ
11 Bi3
12 Bi2
13 Bi1
14 Biφ
OSC 28
5.0 VDD 27
Do3 26
Do2 25
Do1 24
Doφ 23
SNS 22
SNSφ 21
RE 20
TEST 19
Eo3 18
Eo2 17
Eo1 16
Eoφ 15
C302 100P
TP25
TP26
TP27
TP28
TP29
TP30
TP31
TP32
TP33
TP34
TP35
R306 4.7K
R307 4.7K
R308 2.2K
R309 2.2K
R310 47K
R311 47K
R312 4.7K
R313 22K
R314 22K
R315 22K
IC301
IC301 MN1400PE
D328,329 SVDPR5531K
C Speed select
R378 270
CN305
D328
D329
S305 33
S306 45
Speed Selector
D301,302 MA150
D301
D302
D321 ~ 325 SVDPR5531K
Q331,332 2SB641
CN304
REP
D321
D322
D323
D324
D325
R371 270
R372 270
R373 270
R374 270
R375 270
3.8
Q332
0
R376 120K
3.8
D326
Start
S301-1
S301-2
0
Q331
R377 120K
3.8
D327
S303 Cueing
S304 Repeat
S302-1
Stop
S302-2
D326,327 OA90
R303 2.2K
R305 1K
R304 15
5.3
Q301
C301 16V33
TP66
R301 18K
0.1
Q302
0
R302 1K
0.7
0
Q301,302 2SD636
D Operation circuit

8 9 10 11 12 13 14

Q102

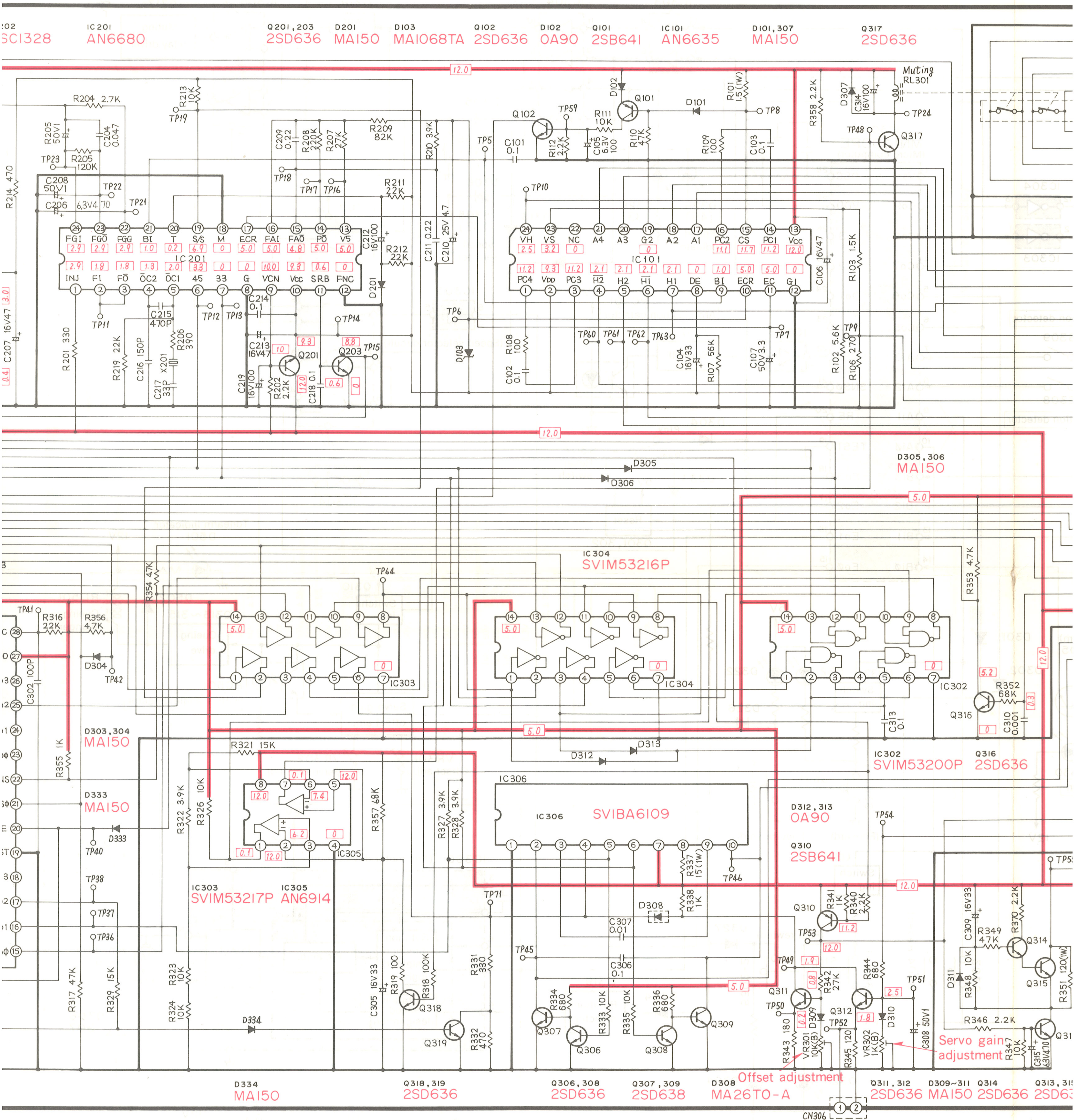
	E	C	B
start	0	5.3	0.06
stop	0	0.1	0.03

Q101

	E	C	B
start	12.0	0.12	11.4
stop	12.0	0.05	11.5

Q317

Muting	E	C	B
on	0	12.0	0.18
off	0	0.11	0.86



IC201 AN6680
Q201, 203 2SD636
D201 MA150
D103 MA1068TA
Q102 2SD636
D102 OA90
Q101 2SB641
IC101 AN6635
D101, 307 MA150
Q317 2SD636
Muting
RL301
12.0
FGI FGO FGG BI T S/S M ECR FAI FAO PO VS
INJ FI FO OC2 OC1 45 33 G VCN Vcc SRB FNC
VH VS NC A4 A3 G2 A2 A1 PC2 CS PC1 Vcc
PC4 VDD PC3 H2 H2 H1 H1 DE BI ECR EC G1
D305, 306 MA150
IC304 SVIM53216P
IC303
IC304
IC302
IC302 SVIM53200P
Q316 2SD636
D303, 304 MA150
D333 MA150
IC305
IC306 SVIBA6109
D312, 313 OA90
Q310 2SB641
IC303 SVIM53217P
IC305 AN6914
D334 MA150
Q318, 319 2SD636
Q306, 308 2SD636
Q307, 309 2SD638
D308 MA26T0-A
Offset adjustment
Servo gain adjustment
Q311, 312 2SD636
D309~311 MA150
Q314 2SD636
Q313, 315 2SD63
CN306

Q318

Cueing	E	C	B
up	0	0.03	0.64
down	0	12.0	0.12

Q319

Motor	E	C	B
stop	0	2.7	0.22
forward	0	2.8	0.71
revers	0	0.1	0.20

Q307

Motor	E	C	B
stop	0	0.02	0.75
forward	0	0.05	0.77
revers	0	4.1	0.08

Q306

Motor	E	C	B
stop	0	0.75	0.21
forward	0	0.77	0.21
revers	0	0.08	0.72

Q308

Motor	E	C	B
stop	0	0.75	0.08
forward	0	0.1	0.71
revers	0	0.77	0.09

Q309

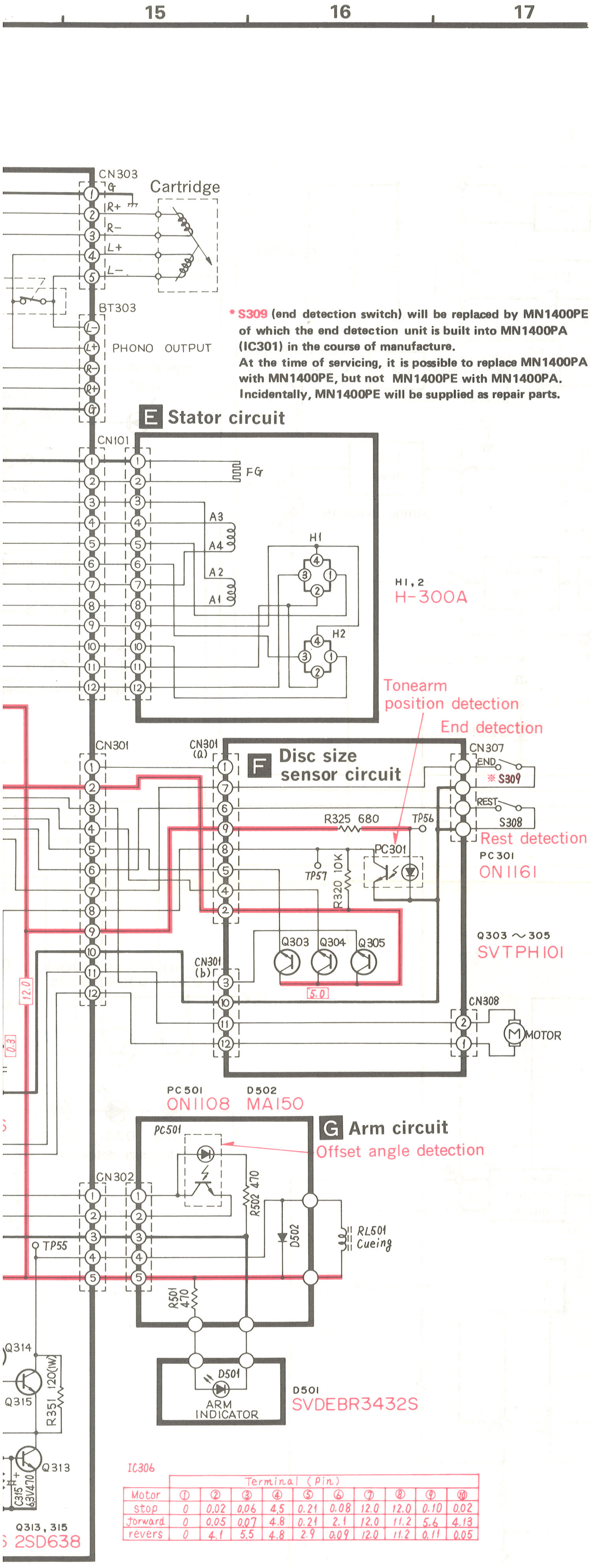
Motor	E	C	B
stop	0	0.02	0.75
forward	0	4.1	0.1
revers	0	0.05	0.77

Q314

Cueing	E	C	B
up	11.7	12.0	12.0
down	0.1	12.0	0.12

Q313

Cueing	E
up	0
down	0


15
16
17
CN303
Cartridge
G
R+
R−
L+
L−
BT303
L
L+
R
R+
G
PHONO OUTPUT
E Stator circuit
CN101
FG
A3
A4
A2
A1
H1
H2
H1, 2
H-300A
Tonearm position detection
End detection
CN301
CN301 (a)
F Disc size sensor circuit
CN307
END
S309
REST
S308
Rest detection
R325 680
TP56
PC301
TP57
R320 10K
PC301
ON1161
Q303
Q304
Q305
Q303 ~ 305
SVTPH101
CN301 (b)
5.0
12.0
0.3
CN308
MOTOR
PC501
ON1108
D502
MA150
G Arm circuit
Offset angle detection
PC501
R502 470
D502
RL501 Cueing
CN302
TP55
R501 470
D501
ARM INDICATOR
D501
SVDEBR3432S
Q314
Q315
R351 120(1W)
Q313
C315 6.3V470
Q313, 315
2SD638

*** S309** (end detection switch) will be replaced by MN1400PE of which the end detection unit is built into MN1400PA (IC301) in the course of manufacture.
At the time of servicing, it is possible to replace MN1400PA with MN1400PE, but not MN1400PE with MN1400PA.
Incidentally, MN1400PE will be supplied as repair parts.

IC306

Motor	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
	Terminal (Pin)									
stop	0	0.02	0.06	4.5	0.21	0.08	12.0	12.0	0.10	0.02
forward	0	0.05	0.07	4.8	0.21	2.1	12.0	11.2	5.6	4.13
revers	0	4.1	5.5	4.8	2.9	0.09	12.0	11.2	0.11	0.05

13

eing	E	C	B
p	0	12.0	0.02
wn	0	0.12	0.8

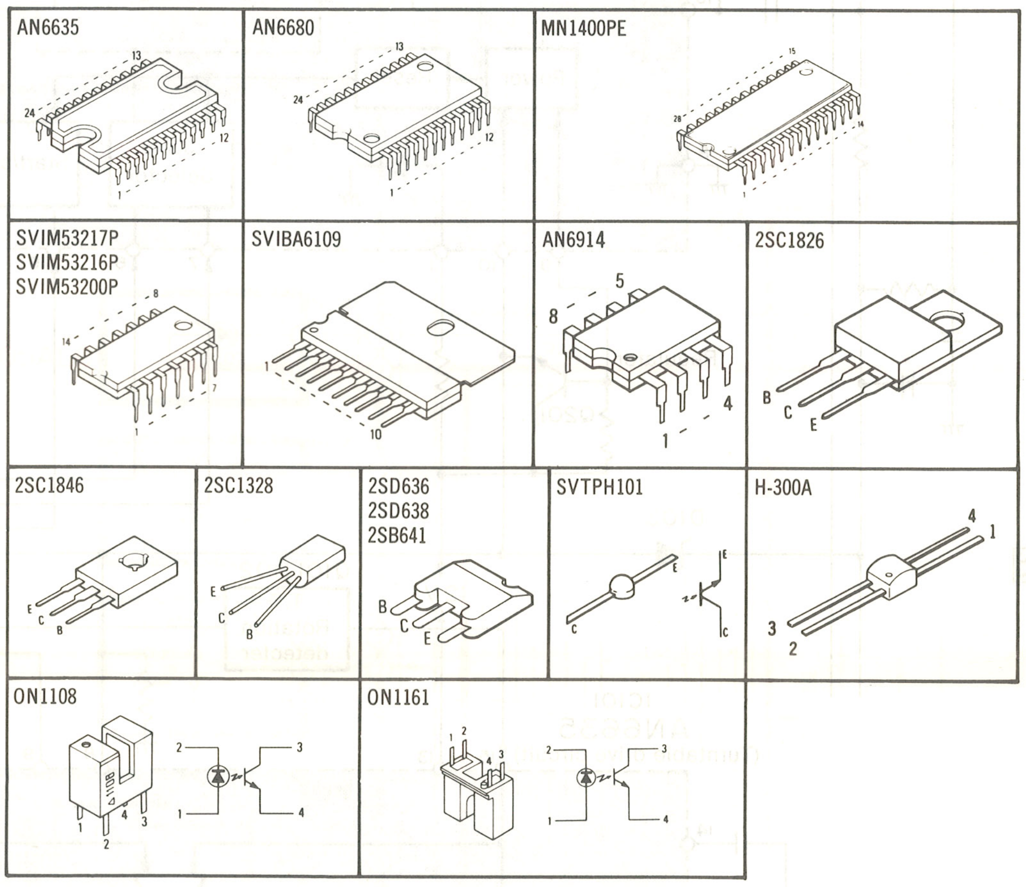
Q315

Cueing	E	C	B
up	12.1	12.1	11.7
down	0.12	8.4	0.1

Notes:

1. **S301-1, 301-2** : Start switch in "**off**" position. (not push condition).
   ◁◀ . . . . .Moves inward (S301-1)
   ◀◀ . . . . .Moves faster (S301-2)
2. **S302-1, 302-2** : Stop switch in "**off**" position. (not push condition).
   ▶▷ . . . . .Moves outward (S302-1)
   ▶▶ . . . . .Moves faster (S302-2)
3. **S303** : Cueing switch in "▼" position. (not push condition).
4. **S304** : Repeat switch in "**off**" position. (not push condition).
5. **S305, 306** : Speed select switch in "**off**" position. (not push condition).
   S305. . . . . 33-1/3 r.p.m. S306. . . . . 45 r.p.m.
6. **S307** : Reset switch in "**on**" position.
7. **S308** : Rest position switch in "**off**" position.
8. **S309** : End position switch in "**off**" position.
9. **S401** : Power switch in "**on**" position.
10. **S402** : Voltage adjuster switch in "**220 — 240V**" position.
    110 — 120V ◀——▶ 220 — 240V
11. The value in ▭ is the standard voltage for this unit operated at 33-1/3r.p.m., which was measured by DC electronic voltmeter (high impedance) on the basis of the chassis. Accordingly, the voltage value may sometimes include a slight error depending on the internal impedance of the DC voltmeter (tester, etc.) used for the measurement.
12. ▬ +Ⓑ voltage line.
13. Important safety Notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

• Terminal guide of transistor, IC's and photo interrupters.


AN6635
AN6680
MN1400PE
SVIM53217P
SVIM53216P
SVIM53200P
SVIBA6109
AN6914
2SC1826
2SC1846
2SC1328
2SD636
2SD638
2SB641
SVTPH101
H-300A
ON1108
ON1161
E
C
B
1
2
3
4
5
8
10
12
13
14
15
24
28

• Reference voltage and waveform at each IC terminal (pin)

This indicated voltage values and waveform are measured by oscilloscope at 33r.p.m. rotation.

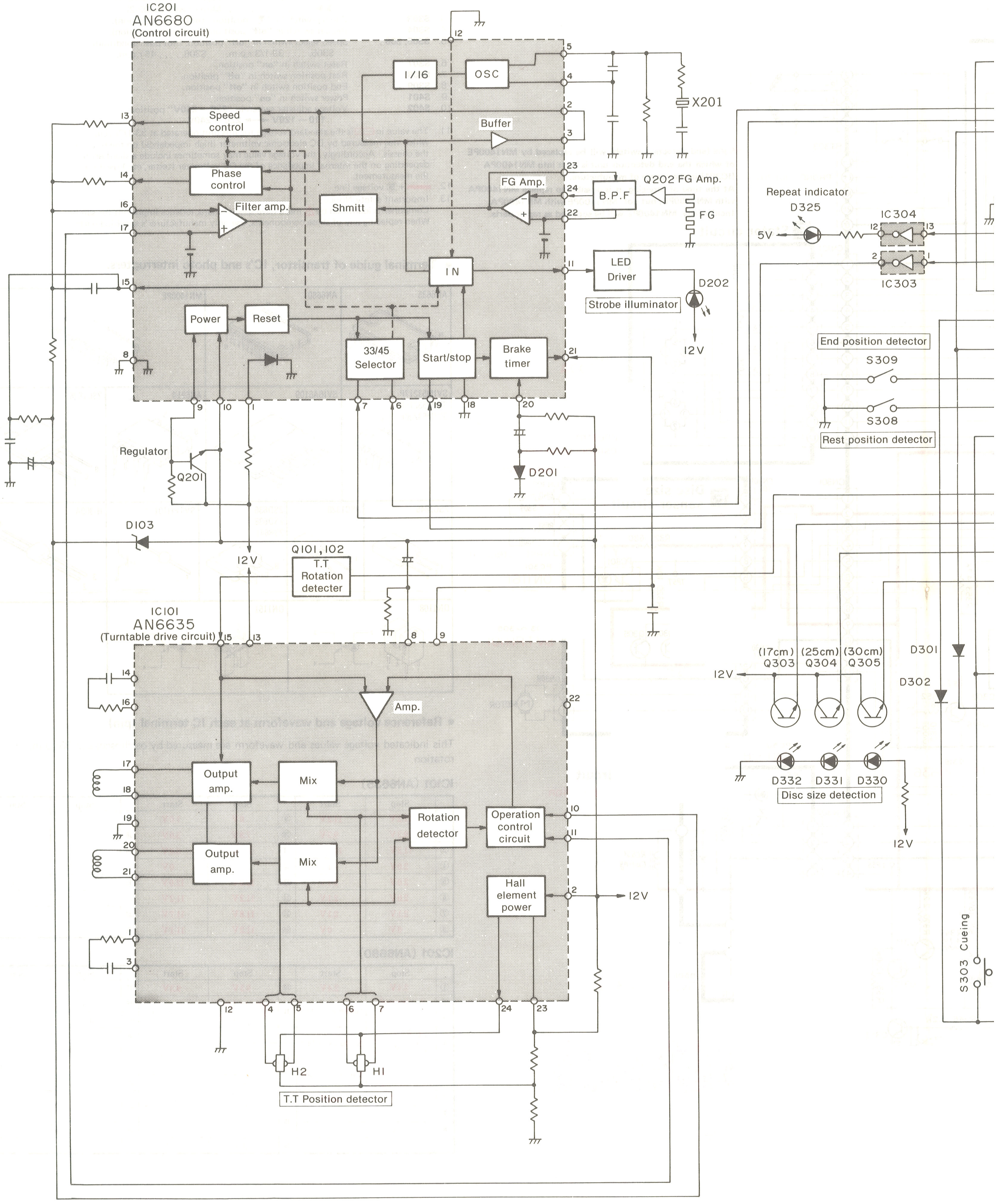
IC101 (AN6635)

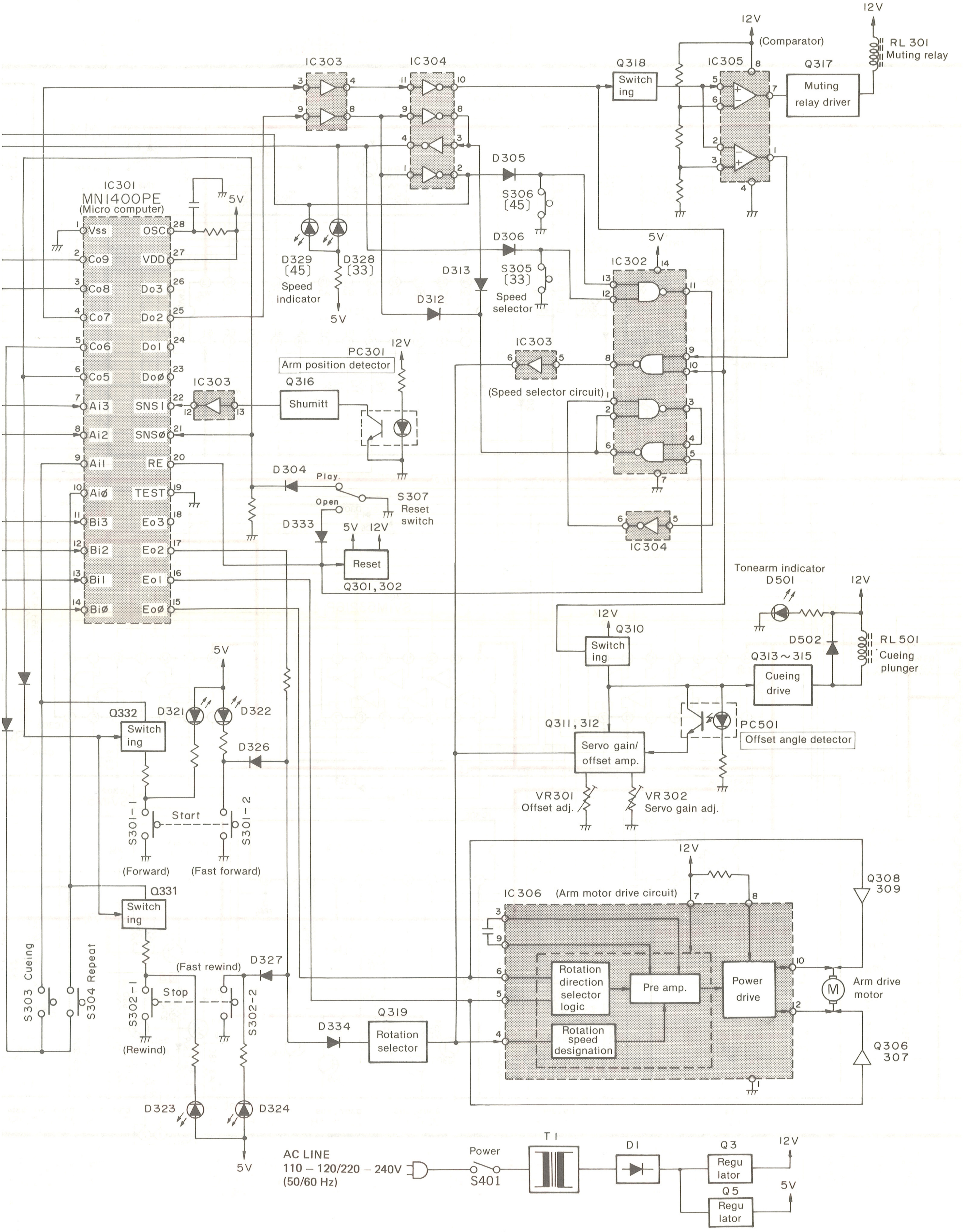
	Stop	Start		Stop	Start		Stop	Start
①	11.2 V	11.2 V	⑨	0 V	1.0 V	⑰ ⑱ ⑳ ㉑	0.6 V	4.0 V 0
②	9.3 V	9.3 V	⑩	7.8 V	5.0 V			
③	11.2 V	11.2 V	⑪	5.0 V	5.0 V			
④	2.0 V	2.1 V	⑫	0 V	0 V			
⑤	2.0 V	2.1 V	⑬	12.0 V	12.0 V	⑲	0 V	0 V
⑥	2.0 V	2.1 V	⑭	11.2 V	11.2 V	㉒	0 V	0 V
⑦	2.1 V	2.1 V	⑮	11.8 V	11.7 V	㉓	3.2 V	3.2 V
⑧	0 V	0 V	⑯	11.2 V	11.1 V	㉔	2.5 V	2.5 V

IC201 (AN6680)

	Stop	Start		Stop	Start		Stop	Start
①	2.4 V	2.4 V	⑩	9.3 V	9.3 V	⑰	5.0 V	5.0 V
② ③	3.9μs 3.8V 0	Same as at left	⑪	0.8V 0.5V 0	Same as at left	⑱	0 V	0 V
						⑲	0.1 V	6.9 V
④	0.25μs 2.4V 0.7V 0	Same as at left	⑫	0 V	0 V	⑳	5.0 V	0.2 V
			⑬	0.15 V	20ms 5.0V 0	㉑	0.1 V	1.5V 0
⑤	0.25μs 3.8V 1.9V 0	Same as at left						
			⑭	20ms 0 1.5V	20ms 5.0V 0	㉒	3.1 V	2.9 V
⑥	3.3 V	3.3 V				㉓	3.1 V	20ms 4.0V 2.0V 0
⑦	0 V	0 V	⑮	8.0 V	5.0V 0			
⑧	0 V	0 V				㉔	2.7 V	2.9 V
⑨	10.0 V	10.0 V	⑯	1.9 V	5.0 V			

■ BLOCK DIAGRAM


IC201
AN6680
(Control circuit)
I/16
OSC
X201
Speed control
Phase control
Buffer
FG Amp.
B.P.F
Q202 FG Amp.
FG
Filter amp.
Shmitt
IN
LED Driver
D202
Strobe illuminator
12V
Power
Reset
33/45 Selector
Start/stop
Brake timer
D201
Regulator
Q201
D103
12V
Q101, 102
T.T Rotation detecter
Repeat indicator
D325
5V
IC304
IC303
End position detector
S309
S308
Rest position detector
IC101
AN6635
(Turntable drive circuit)
Amp.
Output amp.
Mix
Output amp.
Mix
Rotation detector
Operation control circuit
Hall element power
12V
H2
H1
T.T Position detector
(17cm)
(25cm)
(30cm)
12V
Q303
Q304
Q305
D301
D302
D332
D331
D330
Disc size detection
12V
S303 Cueing


12V
(Comparator)
12V
RL 301
Muting relay
IC303
IC304
Q318
Switching
IC305
Q317
Muting relay driver
D305
S306 (45)
D306
S305 (33)
Speed selector
D313
D312
D329 (45)
D328 (33)
Speed indicator
5V
IC301
MN1400PE
(Micro computer)
Vss
Co9
Co8
Co7
Co6
Co5
Ai3
Ai2
Ai1
Aiø
Bi3
Bi2
Bi1
Biø
OSC
VDD
Do3
Do2
Do1
Doø
SNS1
SNSø
RE
TEST
Eo3
Eo2
Eo1
Eoø
IC302
PC301
Arm position detector
Q316
Shumitt
IC303
(Speed selector circuit)
D304
Play
Open
S307
Reset switch
D333
Reset
Q301, 302
IC304
Tonearm indicator
D501
RL501
Cueing plunger
D502
Q313～315
Cueing drive
Q310
Switching
PC501
Offset angle detector
Q311, 312
Servo gain/ offset amp.
VR301
Offset adj.
VR302
Servo gain adj.
Q332
Switching
D321
D322
D326
Start
S301-1
S301-2
(Forward)
(Fast forward)
Q331
Switching
(Fast rewind)
D327
Stop
S302-1
S302-2
(Rewind)
S303 Cueing
S304 Repeat
D323
D324
D334
Q319
Rotation selector
IC306 (Arm motor drive circuit)
Rotation direction selector logic
Pre amp.
Power drive
Rotation speed designation
Q308 309
Q306 307
Arm drive motor
M
AC LINE
110 – 120/220 – 240V
(50/60 Hz)
Power
S401
T1
D1
Q3
Regulator
Q5
Regulator
12V
5V

Continued from page 22

Ref. No.		Part No.	Part Name & Description
R321		**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%
R322		**ERD25FJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R323, 324		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R325		**ERD25FJ681**	Carbon, 680Ω, 1/4W, ± 5%
R326		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R327, 328		**ERD25FJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R329		**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%
R331		**ERD25FJ331**	Carbon, 330Ω, 1/4W, ± 5%
R332		**ERD25FJ471**	Carbon, 470Ω, 1/4W, ± 5%
R333		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R334		**ERD25FJ681**	Carbon, 680Ω, 1/4W, ± 5%
R335		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R336		**ERD25FJ681**	Carbon, 680Ω, 1/4W, ± 5%
R337		**ERG1ANJ150**	Metal Oxide, 15Ω, 1W, ± 5%
R338		**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R340		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R341		**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R342		**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ± 5%
R343		**ERD25FJ181**	Carbon, 180Ω, 1/4W, ± 5%
R344		**ERD25FJ681**	Carbon, 680Ω, 1/4W, ± 5%
R345		**ERD25FJ121**	Carbon, 120Ω, 1/4W, ± 5%
R346		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R347, 348		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R349		**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%
R351		**ERG1ANJ121**	Metal Oxide, 120Ω, 1W, ± 5%
R352		**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ± 5%
R353, 354		**ERD25FJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%
R355		**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R356		**ERD25FJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%
R357		**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ± 5%
R358		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R361, 362		**ERD25FJ271**	Carbon, 270Ω, 1/4W, ± 5%
R363, 364		**ERD25FJ271**	Carbon, 270Ω, 1/4W, ± 5%
R365		**ERD25FJ271**	Carbon, 270Ω, 1/4W, ± 5%
R366, 367		**ERD25TJ124**	Carbon, 120kΩ, 1/4W, ± 5%
R368		**ERD25FJ271**	Carbon, 270Ω, 1/4W, ± 5%
R369		**ERD25FJ331**	Carbon, 330Ω, 1/4W, ± 5%
R370		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R401	⚠	**ERD50TJ4R7**	Carbon, 4.7Ω, 1/2W, ± 5%
R501, 502		**ERD25FJ471**	Carbon, 470Ω, 1/4W, ± 5%

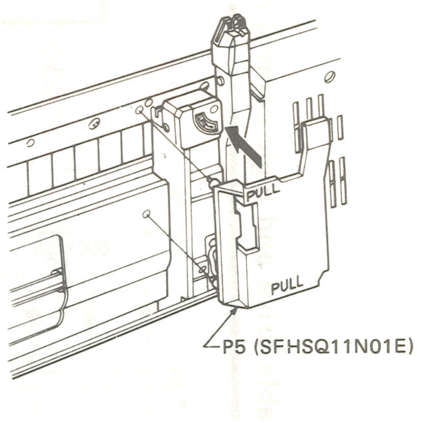
Ref. No.		Part No.	Part Name & Description
CAPACITORS			
C1, 2		ECKD1H223PF	Ceramic, 0.022μF, 50V, $^{+100}_{-0}\%$
C3		**ECEB1VS102**	Electrolytic, 1000μF, 35V
C4		**ECEA1CS330**	Electrolytic, 33μF, 16V
C5		**ECEA1ES470**	Electrolytic, 47μF, 25V
C6		**ECEA0JS471**	Electrolytic, 470μF, 6.3V
C101, 102		ECQM1H104KZ	Polyester, 0.1μF, 50V, ± 10%
C103		ECQM1H104KZ	Polyester, 0.1μF, 50V, ± 10%
C104		**ECEA1CS330**	Electrolytic, 33μF, 16V
C105		**ECEA1AS101**	Electrolytic, 100μF, 10V
C106		**ECEA1ES470**	Electrolytic, 47μF, 25V
C107		**ECEA50Z3R3**	Electrolytic, 3.3μF, 50V
C201		**ECEA1CS330**	Electrolytic, 33μF, 16V
C202		**ECEA50Z1**	Electrolytic, 1μF, 50V
C203		**ECEA50M1R**	Electrolytic, 1μF, 50V
C204		ECQM1H473KZ	Polyester, 0.047μF, 50V, ± 10%
C205		**ECEA50Z1**	Electrolytic, 1μF, 50V
C206		**ECEA0JS471**	Electrolytic, 470μF, 6.3V
C207		**ECEA1ES470**	Electrolytic, 47μF, 25V
C208		**ECEA50Z1**	Electrolytic, 1μF, 50V
C209		ECQV05224JZ	TF, 0.22μF, 50V, ± 5%
C201		**ECEA25Z4R7**	Electrolytic, 4.7μF, 25V
C211		ECQV05224JZ	TF, 0.22μF, 50V, ± 5%
C212		**ECEA1ES101**	Electrolytic, 100μF, 25V
C213		**ECEA1ES470**	Electrolytic, 47μF, 25V
C214		ECKF1E104ZV	Ceramic, 0.1μF, 25V, $^{+80}_{-20}\%$
C215		ECCD1H471K	Ceramic, 470pF, 50V, ± 10%
C216		ECCD1H151K	Ceramic, 150pF, 50V, ± 10%
C217		ECCD1H330K	Ceramic, 33pF, 50V, ± 10%
C218		ECKF1E104ZV	Ceramic, 0.1μF, 25V, $^{+80}_{-20}\%$
C301		**ECEA1CS330**	Electrolytic, 33μF, 16V
C302		ECCD1H101K	Ceramic, 100pF, 50V, ± 10%
C303, 304		ECKD1H102KB	Ceramic, 0.001μF, 50V, ± 10%
C305		**ECEA16Z33**	Electrolytic, 33μF, 16V
C306		ECQM1H104KZ	Polyester, 0.1μF, 50V, ± 10%
C307		ECQM1H103KZ	Polyester, 0.01μF, 50V, ± 10%
C308		**ECEA50Z1**	Electrolytic, 1μF, 50V
C309		**ECEA1CS330**	Electrolytic, 33μF, 16V
C310		ECQM1H102KB	Polyester, 0.001μF, 50V, ± 10%
C311, 312		ECKF1E104ZV	Ceramic, 0.1μF, 25V, $^{+80}_{-20}\%$
C313,		ECKF1E104ZV	Ceramic, 0.1μF, 25V, $^{+80}_{-20}\%$
C314		**ECEA1ES101**	Electrolytic, 100μF, 25V
C315		**ECEA0JS471**	Electrolytic, 470μF, 6.3V
C401 [E],[EK],[XL]	⚠	ECNC4A473MD	Paper, 0.047μF, 450VAC, ± 20%
C401	⚠	ECQE2A473MZ	Polyester, 0.047μF, 250VAC, ± 20%

Areas

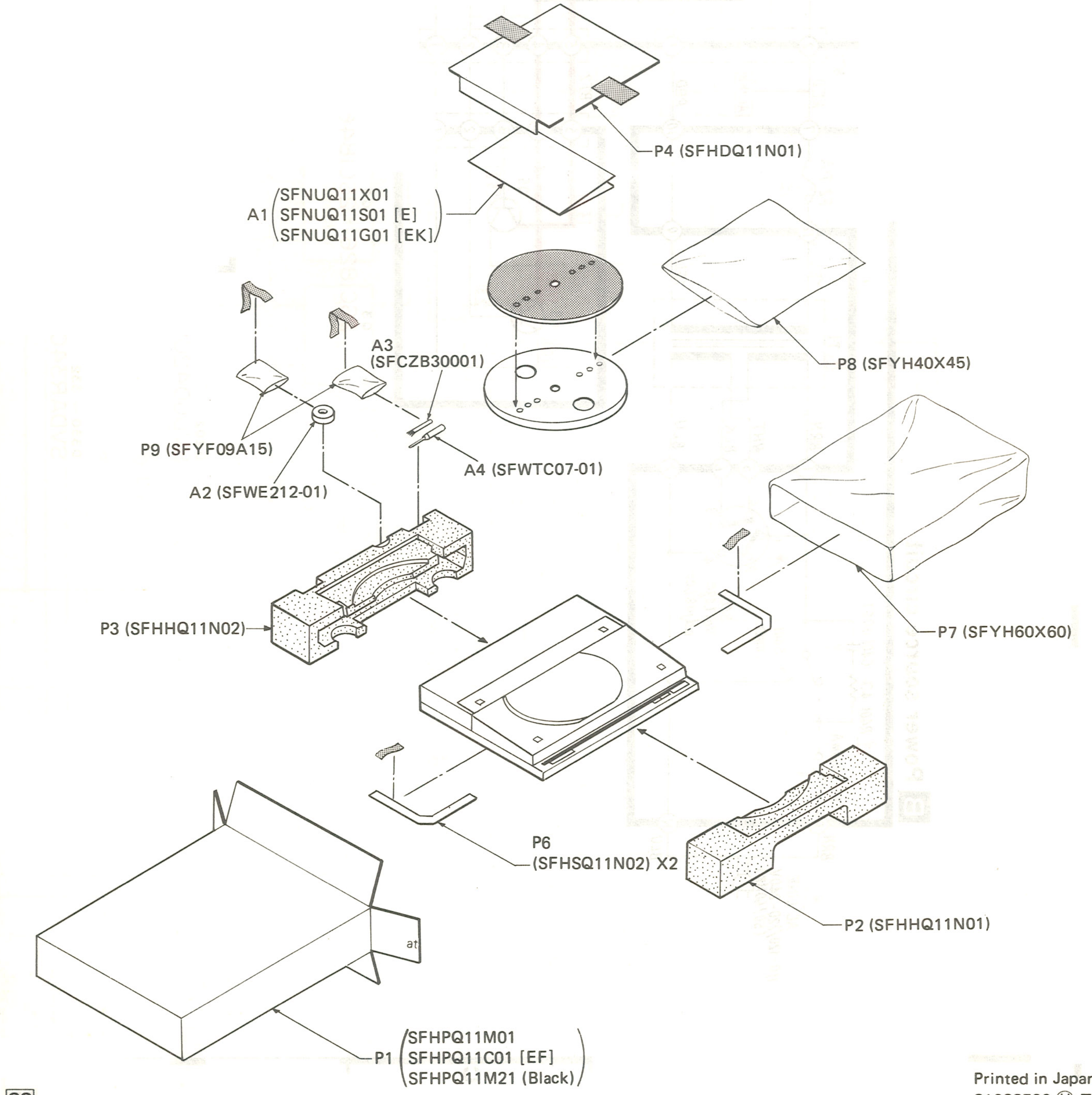
- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EF] is available in France.
- * [EB] is available in Belgium.
- * [EG] is available in F.R. Germany.
- * [EI] is available in Italy.
- * [EH] is available in Holland.
- * [XA] is available in East South Asia, Oceania, Africa, Middle Near East and Central South America.

■ PACKING

1. Make sure that the tonearm is at the start position (the outermost periphery of turntable).
2. Mount the arm spacer. (Do not lock the arm.)



3. Pack the components according to the following procedure.



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